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DEPARTMENT OF COMMERCE

U.S. BUREAU OF FISHERIES

HUGH M. SMITH, Commissioner

COMMERCIAL FISHERIES OF THE UNITED STATES AND THE OPERATIONS OF THE BUREAU OF FISHERIES IN CONNECTION THEREWITH DURING FISCAL YEAR ENDED JUNE 30, 1916

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[Extracted from the Report of the Commissioner of Fisheries
to the Secretary of Commerce for the fiscal year ended June 30,
1916, pages 50-100.]



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COMMERCIAL FISHERIES.

Investigations completed by the Bureau during the year, in addition to the work of local agents in collecting data for important mussel fisheries on the Atlantic and Pacific coasts, included canvasses of the fresh-water mussel fishery of the Mississippi River and its western tributaries from Kansas northward; the fisheries of Lakes Pepin and Cooper in the Mississippi River, the former between Minnesota and Wisconsin, and the latter at Keokuk, Iowa; the crab industry of Maryland and Virginia; the shad and alewife industry of Chesapeake Bay and tributaries; the coastal fisheries of New York and New Jersey, exclusive of shellfish, for 1915; and the shad fishery of the Hudson River for 1915 and 1916. The inquiries relating to the fresh-water mussel fishery in the region referred to, and those relating to the shad and alewife industry, were begun the latter part of the preceding fiscal year.

FRESH-WATER MUSSEL FISHERY.

The general canvass of the fresh-water mussel fishery, which has been in progress for several years, was completed during the past year. The streams covered were the Mississippi River and its western tributaries from Kansas northward, except the Neosho River in Kansas, which was included in the work of a previous year; and the data collected were for the calendar year 1914. A special bulletin giving the results of the canvass was issued and distributed. The number of persons engaged in the mussel fishery in these streams in 1914 was 1,873, and the investment in boats, fishing apparatus, and shore and accessory property amounted to \$132,267. The products included 8,539 tons of shells, valued at \$148,960, and pearls found in the mussels to the value of \$62,902, a total of \$211,862. All the shells were used in the manufacture of pearl buttons. The principal fishing apparatus used in taking mussels is the crowfoot bar, the catch with this appliance in this region amounting to 6,524 tons of shells, valued at \$120,859. The remainder of the catch was taken with forks, rakes, diggers, tongs, scoops, or basket rakes, and by hand while wading.

Mississippi River.—The most important of these streams is the Mississippi River, the products of which amounted to 6,626 tons of shells, valued at \$125,948, and \$50,562 worth of pearls, a total of \$176,510 in value. This shows a decline of about 58 per cent in quantity and 61 per cent in value of the output of shells and pearls since 1903, the last previous year for which data are available. In view of the fact that the mussel fishery has been prosecuted in the Mississippi River for nearly 25 years, the decline in the output is not so surprising. Nearly 94 per cent of the river's catch in 1914 was taken with crowfoot bars, and of the remainder 2 per cent were taken with forks, 2 per cent with rakes, and 2 per cent with diggers and tongs. Fishing with crowfoot bars is more vigorously prosecuted in Lake Pepin than in any other portion of the river. In many cases two rowboats or scows are connected by a bar or pole 10 to 15 feet long, a gasoline boat pushing against the middle of the bar

being used as the propelling power. The two small boats are provided with 4 crowfoot bars, 3 of which are being fished while the fourth is having the mussels removed from it. Usually two men, but occasionally only one man, handle such an outfit.

Mussel fishing on this river in 1914 was followed from Pine Bend, about 20 miles below St. Paul, Minn., to the mouth of the Missouri River, near Alton, Ill., the fishing ending abruptly at that point. A few shells have been taken as far up the river as Bemidji, Minn., but no sale of them has ever been made. Probably the most productive portion of the river in 1914 was in the vicinity of Frontenac, Minn., where, within a few miles, the 45 men engaged caught £45 tons of shells, valued at \$10,570, and \$2,100 worth of pearls and slugs. The beds near Maiden Rock, Wis., were also quite profitable, the output of 36 men amounting to 390 tons, valued at \$6,630, and \$2,100 worth of pearls. Lake Pepin as a whole produced 1,932 tons of shells, valued at \$31,486, and \$11,820 worth of pearls. It is said that there were at least 1,000 men fishing for mussels in Lake Pepin in 1911, the catch amounting to about 4,000 tons, compared with an output of less than 2,000 tons in 1914 taken by 281 fishermen.

In 1900, when the first mussel fishing was done at Red Wing, Minn., there were said to have been 75 boats at work on the beds there, compared with 8 boats in 1914. The first mussel fishing at New Albin, Iowa, was in 1899, when there were at least 20 men working on the beds, which yielded an average day's catch per man of several thousand pounds, compared with 150 to 200 pounds now. In the early days of the fishery very few shells other than niggerheads were saved. As recently as 1910 as many as 70 or 80 men worked on the mussel beds opposite New Boston, Ill., while in 1914 only 15 men were engaged and small catches were made. There were 15 or 18 mussel fishermen out of Quincy, Ill., in 1900, while in 1915 there were none, this being due both to overfishing and to the building of dams and dikes by the Government to preserve the channel of the river. Similar changes have taken place at Canton, Mo., where a button factory is located, but the shell supply is obtained from various parts of the Mississippi Valley. The mussel beds in the vicinity of Prairie du Chien a few years ago were the most prolific by-far of any in the entire river, but in 1914 the catch of 100 men in that vicinity amounted to only 385 tons, valued at \$6,872, and \$5,500 worth of pearls and slugs.

A great decline has taken place also in the beds near Muscatine, Iowa, where the industry was first established in 1891. The near exhaustion of the beds in this vicinity has caused many of the local fishermen to seek unworked mussel streams in various parts of the country.

The catch of the Mississippi River as a whole was divided among the different species approximately as follows: Niggerheads, 25 per cent; three-ridges (including blue-points), 23 per cent; wartybacks, 13 per cent; muckets, 13 per cent; pig-toes, 6 per cent; washboards, 6 per cent; pocketbooks, 3 per cent; yellow sand-shells, 2 per cent; Missouri niggerheads, 2 per cent; pistol-grips, 2 per cent; and monkey-faces, 1 per cent. The remaining 4 per cent consist of black sand-shells, ladyfingers, bullheads, and a few other unimportant species.

Cedar River.—The catch of this river was apportioned among the different forms of apparatus as follows: 54 per cent with forks, 22 per cent with hands while wading, 18 per cent with crowfoot bars, and the remainder with rakes. Muckets predominated in the catch,

with a percentage of 57. The remainder was divided as follows: Three-ridges and blue-points, 18 per cent; pocketbooks, 10 per cent; warty-backs, 3 per cent; pigtoes, 1 per cent; and a few each of pistol-grips, black sand-shells, butterflies, maple-leaves, and other unimportant species.

A few pearls and slugs were taken from this river as far up as Osage, Iowa, in 1914, but Charles City, Iowa, and vicinity was the upper limit of shell fishing. The most productive beds were in the vicinity of Cedar Rapids. This was also the lowest point on the river where shells were taken. The catch of 15 men in that locality amounted to 130 tons, valued at \$2,020, and \$975 worth of pearls and slugs.

The first mussel shells were taken for market from this river in 1905 near Vinton, where a button factory was established about that time and operated for several years.

Des Moines River.—More than 75 per cent of the river's output is taken between Ottumwa, Iowa, and about 15 miles below that city. Forty-five tons of shells were taken from the east fork of the river as far north as between Bert and Bancroft, this being the first year in which work was done on that branch of the river. The lowest point at which shells were taken was near Keosauqua, Iowa, an output of 17 tons being shown for that vicinity. The prevailing species were three-ridges (including blue-points), warty-backs, muckets, and pigtoes, with percentages of 45, 18, 15, and 13, respectively. The remainder was made up of pistol-grips, maple-leaves, monkey-faces, lady-fingers, pocketbooks, etc. About 63 per cent of the catch was made with forks, 29 per cent with hands while wading, and the remainder with rakes. The first record of any shells being taken from this river was near Keosauqua in 1910.

James River.—This river, said to be the longest unnavigable river in the United States, supported mussel fisheries from Riverside, S. Dak., to within a few miles of its mouth—Yankton, S. Dak. The most prolific beds were between Milltown and Olivet, S. Dak., and those located a few miles above and below Yankton. The total output of the river in 1914 amounted to 260 tons, valued at \$3,498, and \$700 worth of pearls and slugs. Twenty-seven persons were engaged in the fishery and had an investment of \$1,460, including apparatus, boats, and shore property. About 90 per cent of the catch was taken with scoops, or basket rakes, and the remainder with forks and by hand. The output was composed of 85 per cent three-ridges (including blue-points), 10 per cent fat muckets, and the remainder maple-leaves, pocketbooks, and heel-splitters. The first record of any mussel fishing being done in the James River was in 1912. Pearls, however, were taken several years previously.

Osage and Marais des Cygnes Rivers.—The Osage and Marais des Cygnes Rivers are treated as one, the latter being the name given to that portion of the river flowing through Kansas. Forty men, with an investment of \$1,261, were engaged in shelling on this river from near Trading Post, Kans., as far down as Warsaw, Mo. The total output in 1914 amounted to 204 tons of shells, with a value of \$2,111, and \$380 worth of pearls. About 37 per cent of the catch was made with forks, 26 per cent with hands while wading, 22 per cent with crowfoot bars, and the remainder with diggers and tongs. The output was apportioned among the different species as follows: Three-

ridges (including blue-points), 43 per cent; washboards, 17 per cent; pig-toes, 15 per cent; muckets, 12 per cent; and a few each of warty-backs, monkey-faces, lady-fingers, pistol-grips, maple-leaves, and butterflies. The most prolific beds were those between Warsaw and 55 miles above that town, 22 men working on these beds obtaining 110 tons, with a value of \$1,540, and \$100 worth of pearls.

Wapsipinicon River.—Mussel fishing on this river in 1914 extended from Independence as far down as Anamosa, Iowa. The total output was 132 tons, valued at \$1,797, together with \$765 worth of pearls and slugs. The 37 persons engaged had an investment, in apparatus, boats, and shore property, of \$811. More than 50 per cent of the catch was made with forks, the remainder being taken by hand while wading, and with crowfoot bars, and rakes. The catch was divided among the different species as follows: 71 per cent muckets, 15 per cent blue-points and three-ridges, 10 per cent pocketbooks, and the remainder warty-backs, squaw-foots, pig-toes, and heel-splitters. The first mussel fishing on this river of which there is any record was in 1908.

Iowa River.—The total output of this river in 1914 was 93 tons of shells, valued at \$1,038, and \$2,975 worth of pearls and slugs. The 86 persons engaged had an investment of \$345 in apparatus, \$500 in boats, and \$300 in shore property. More than one-half of the shells were taken with hands while wading, about 25 per cent with forks, and the remainder with crowfoot bars and rakes. The shells were apportioned among the various species as follows: 42 per cent muckets, 30 per cent pocketbooks, 20 per cent three-ridges (including blue-points), and the remainder divided among warty-backs, squaw-foots, pistol-grips, black sand-shells, maple-leaves, pig-toes, lady-fingers, heel-splitters, and butterflies. Pearls were found as far up the river as Popejoy, but the upper limit of mussel fishing was near Eldora, from which place it was followed at intervals as far down the river as North Liberty. The first mussels for commercial use were taken from this river in 1908.

Minnesota River.—Mussels were taken at intervals along this river in 1914 from Montevideo, Minn., to within a short distance of its mouth, the total output amounting to 118 tons of shells, valued at \$1,254, and \$455 worth of pearls. The 13 men engaged had \$120 invested in apparatus, \$280 in boats, and \$145 in shore property. The most important catch was made in the vicinity of New Ulm, Minn. The entire output of the river was taken with crowfoot bars, and was composed of 56 per cent three-ridges (including blue-points), 27 per cent muckets, 6 per cent washboards, 5 per cent warty-backs, and a few each of niggerheads, pig-toes, and pistol-grips. The first commercial fishing in the Minnesota River was done near its mouth in 1905 by a few fishermen from the Mississippi River, who remained only a short time. Work was followed up more steadily from 1909.

Meramec River.—Mussel shells were taken from the Meramec River in 1914 at various localities between St. Clair and Valley Park, Mo., the total output amounting to 90 tons, valued at \$830, and \$465 worth of pearls and slugs. The 30 fishermen engaged had an investment of \$280 in apparatus, boats, and shore property. Nearly nine-tenths of the mussels were taken by hand and the remainder with crowfoot bars. Muckets composed about 43 per cent, three-ridges

26 per cent, washboards 8 per cent, and warty-backs and pistol-grips, or buckhorns, 7 per cent each of the catch, the balance being made up of pig-toes, niggerheads, maple-leaves, and monkey-faces. The first commercial fishing on this river was in 1910.

Blue River.—Some mussel fishing was done on this river near Beatrice, Nebr., in 1914, a total catch of 55 tons of shells, valued at \$770, being reported.

South Skunk River.—The 5 fishermen on this river caught 43 tons of mussel shells, valued at \$602, and \$310 worth of pearls and slugs from the South Skunk River near Oskaloosa, Iowa, in 1914. Some shells were taken from the Skunk River proper in 1913, but none in 1914.

Shell Rock River.—Mussels were taken from this river between Marble Rock and Shell Rock, Iowa, the total output, however, being only 32 tons, valued at \$354, and \$210 worth of pearls and slugs. Only 6 men were engaged on the entire stream in 1914. One-half of the catch was made with forks, and the remainder with hands, crow-foot bars, and rakes. The different species were found in the following proportions: Pocketbooks, 47 per cent; muckets, 43 per cent; blue-points, or three-ridges, 8 per cent; and a few squaw-foots. No shelling was done on the river previous to 1908.

Cottonwood and Bourbeuse Rivers.—The two remaining streams in the region canvassed were the Cottonwood and Bourbeuse Rivers. Shells were taken on the former river at Cottonwood Falls, Kans., and on the latter near St. Clair, Mo., the combined catch of the two rivers amounting to 65 tons, valued at \$430, and \$60 worth of pearls and slugs.

Statistics of the mussel fishery.—Complete statistics for all of the mussel-bearing streams of the Mississippi Valley show a total of 10,331 persons engaged in the fishery, an investment of \$540,608, and a catch of 51,571 tons of shells, valued at \$825,776, together with \$376,284 worth of pearls and slugs; the total value of the products amounting to \$1,202,060. Statistics of the mussel fishery of the Mississippi River and its western tributaries from Kansas northward for 1914, and of the entire Mississippi Valley in three sections for 1912, 1913, and 1914, respectively, are given in the following tables:

FRESH-WATER MUSSEL FISHERY OF THE MISSISSIPPI RIVER AND ITS WESTERN TRIBUTARIES FROM KANSAS NORTHWARD IN 1914.^a

| Items. | Blue River, Nebr., and Cottonwood River, Kans. | | Cedar River, Iowa. | | Des Moines River, Iowa. | | Iowa River, Iowa. | | James River, S. Dak. | | Meramec and Bour- beuse Rivers, Mo. | |
|--|---|--------|--------------------------|--------|-------------------------------|--------|-------------------------|--------|----------------------------|--------|--|--------|
| | No. | Value. | No. | Value. | No. | Value. | No. | Value. | No. | Value. | No. | Value. |
| Persons engaged: | | | | | | | | | | | | |
| Fishermen..... | 7 | | 80 | | 31 | | 86 | | 27 | | 32 | |
| Shoemen..... | | | 10 | | | | | | | | | |
| Total..... | 7 | 90 | | 31 | | 86 | | 27 | | 32 | | |
| Fishermen, classified by methods used: | | | | | | | | | | | | |
| Crowfoot bars..... | | | 25 | | | | 20 | | | | 4 | |
| Forks..... | | | 77 | | 31 | | 85 | | 2 | | | |
| Rakes..... | | | 6 | | 3 | | 40 | | | | | |
| Diggers or dredgers..... | | | | | | | | | | | | |
| Tongs..... | | | | | | | | | | | | |
| Scoops, or basket rakes..... | | | | | | | | | 25 | | | |
| Waders..... | 7 | 60 | | 30 | | 86 | | 2 | | 32 | | |
| Total, exclusive of duplication..... | 7 | 80 | | 31 | | 86 | | 27 | | 32 | | |
| Boats: | | | | | | | | | | | | |
| Rowboats..... | 7 | \$55 | 74 | \$660 | 31 | \$295 | 82 | \$500 | 13 | \$245 | 28 | \$130 |
| Gasoline boats..... | | | 3 | 265 | | | | | 9 | 995 | | |
| House-boats..... | | | | | | | | | | | | |
| Total..... | 7 | 55 | 77 | 925 | 31 | 295 | 82 | 500 | 22 | 1,240 | 28 | 130 |
| Apparatus: | | | | | | | | | | | | |
| Crowfoot bars.....pairs | | | 25 | 365 | | | 20 | 200 | | | 2 | 20 |
| Forks..... | | | 77 | 103 | 31 | 44 | 85 | 115 | 2 | 3 | | |
| Rakes..... | | | 6 | 6 | 3 | 2 | 40 | 30 | | | | |
| Diggers or dredgers..... | | | | | | | | | | | | |
| Tongs..... | | | | | | | | | 15 | 67 | | |
| Scoops, or basket rakes..... | | | | | | | | | | | | |
| Total..... | | | | 474 | | 46 | | 345 | | 70 | | 20 |
| Shore and accessory property..... | | 10 | | 565 | | 375 | | 300 | | 220 | | 150 |
| Total investment..... | | 65 | | 1,964 | | 716 | | 1,145 | | 1,530 | | 300 |
| Products: | | | | | | | | | | | | |
| Shells— | | | | | | | | | | | | |
| With crowfoot bars.....tons | | | 87 | 994 | | | 10 | 110 | | | 10 | 90 |
| With forks.....do..... | | | 261 | 3,316 | 211 | 2,777 | 23 | 256 | 20 | 240 | | |
| With rakes.....do..... | | | 20 | 255 | 25 | 325 | 10 | 110 | | | | |
| With diggers or dredgers, tons..... | | | | | | | | | | | | |
| With tongs.....tons..... | | | | | | | | | | | | |
| With scoops, or basket rakes.....tons..... | | | | | | | | | | | | |
| With hands.....do..... | 110 | 1,120 | 117 | 1,331 | 100 | 1,300 | 50 | 562 | 8 | 96 | 90 | 820 |
| Total..... | 110 | 1,120 | 485 | 5,926 | 336 | 4,402 | 93 | 1,038 | 260 | 3,498 | 100 | 910 |
| Pearls..... | | 100 | | 3,665 | | 2,305 | | 2,975 | | 700 | | 475 |
| Total value of products..... | | 1,220 | | 9,591 | | 6,707 | | 4,013 | | 4,198 | | 1,385 |

^a Not including the Neosho River, shown in another table.

FRESH-WATER MUSSEL FISHERY OF THE MISSISSIPPI RIVER AND ITS WESTERN TRIBUTARIES FROM KANSAS NORTHWARD IN 1914^a—Continued.

| Items. | Minnesota River, Minn. | | Mississippi River. | | Osage and Marais des Cygnes Rivers, Mo. and Kans. | | Shell Rock and South Skunk Rivers, Iowa. | | Wapsipinicon River, Iowa. | | Total. | |
|---|------------------------|--------|--------------------|----------|---|--------|--|--------|---------------------------|--------|--------|----------|
| | No. | Value. | No. | Value. | No. | Value. | No. | Value. | No. | Value. | No. | Value. |
| Persons engaged: | | | | | | | | | | | | |
| Fishermen..... | 13 | | 1,383 | | 39 | | 11 | | 35 | | 1,744 | |
| Shoemen..... | | | 115 | | 1 | | 1 | | 2 | | 129 | |
| Total..... | 13 | | 1,498 | | 40 | | 12 | | 37 | | 1,873 | |
| Fishermen, classified by methods used: | | | | | | | | | | | | |
| Crowfoot bars..... | 13 | | 1,364 | | 8 | | 3 | | 15 | | 1,452 | |
| Forks..... | | | 48 | | 25 | | 10 | | 35 | | 313 | |
| Rakes..... | | | 33 | | | | 5 | | 2 | | 89 | |
| Diggers or dredgers..... | | | 9 | | 2 | | | | | | 11 | |
| Tongs..... | | | 14 | | 10 | | | | | | 24 | |
| Scoops, or basket rakes..... | | | | | | | | | | | 25 | |
| Waders..... | | | | | | | 5 | | 29 | | 268 | |
| Total, exclusive of duplication..... | 13 | | 1,383 | | 39 | | 11 | | 35 | | 1,744 | |
| Boats: | | | | | | | | | | | | |
| Rowboats..... | 9 | \$95 | 734 | \$12,360 | 32 | \$205 | 10 | \$80 | 35 | \$235 | 1,055 | \$14,860 |
| Gasoline boats..... | 3 | 185 | 731 | 72,755 | 2 | 650 | | | 1 | 100 | 749 | 74,950 |
| House-boats..... | | | 55 | 6,595 | | | | | | | 55 | 6,595 |
| Total..... | 12 | 280 | 1,520 | 91,710 | 34 | 855 | 10 | 80 | 36 | 335 | 1,859 | 96,405 |
| Apparatus: | | | | | | | | | | | | |
| Crowfoot bars—pairs..... | 10 | 120 | 1,405 | 16,816 | 8 | 80 | 3 | 39 | 15 | 200 | 1,488 | 17,840 |
| Forks..... | | | 48 | 103 | 25 | 31 | 10 | 13 | 35 | 44 | 313 | 456 |
| Rakes..... | | | 23 | 51 | | | 5 | 4 | 2 | 2 | 79 | 95 |
| Diggers or dredgers..... | | | 32 | 164 | 2 | 10 | | | | | 34 | 174 |
| Tongs..... | | | 14 | 70 | | | | | | | 14 | 70 |
| Scoops, or basket rakes..... | | | | | | | | | | | 15 | 67 |
| Total..... | | 120 | | 17,204 | | | 121 | | 56 | | 246 | |
| Shore and accessory property..... | | | | | | | | | | | | |
| | 145 | | 14,795 | | | | 285 | | 85 | | 230 | |
| Total investment..... | | | | | | | 1,261 | | 221 | | 811 | |
| Products: | | | | | | | | | | | | |
| Shells— | | | | | | | | | | | | |
| With crowfoot bars, tons..... | 118 | 1,254 | 6,216 | 117,238 | 45 | 630 | 13 | 168 | 25 | 375 | 6,524 | 120,859 |
| With forks, tons..... | | | 149 | 3,308 | 75 | 730 | 41 | 526 | 72 | 985 | 852 | 12,138 |
| With rakes, do..... | | | 132 | 3,049 | | | 11 | 150 | 8 | 100 | 206 | 4,019 |
| With diggers or dredgers, tons..... | | | | 85 | 1,393 | 20 | 280 | | | | 105 | 1,673 |
| With tongs, do..... | | | 44 | 960 | 10 | 140 | | | | | 54 | 1,100 |
| With scoops, or basket rakes, tons..... | | | | | | | 54 | 331 | 10 | 112 | 27 | 232 |
| With hands, do..... | | | | | | | | | | | 566 | 3,162 |
| Total..... | 118 | 1,254 | 6,626 | 125,948 | 204 | 2,111 | 75 | 956 | 132 | 1,797 | 8,539 | 148,960 |
| Pearls..... | | 455 | | 50,562 | | 380 | | 520 | | 765 | | 62,902 |
| Total value of products..... | | 1,709 | | 176,510 | | 2,491 | | 1,476 | | 2,562 | | 211,862 |

^a Not including the Neosho River, shown in another table.

FRESH-WATER MUSSEL FISHERY OF THE MISSISSIPPI VALLEY.

| Items. | Streams tributary to Gulf of Mexico from Ohio River southward in 1912. ^a | | Streams tributary to Great Lakes and Ohio and Mississippi Rivers north of the Ohio and east of the Mississippi River in 1913. ^b | | Mississippi River and its western tributaries from Kansas northward in 1914. ^c | | Total. ^d |
|--|---|----------|--|----------|---|----------|---------------------|
| | No. | Value. | No. | Value. | No. | Value. | |
| Persons engaged: | | | | | | | |
| Fishermen..... | 4,665 | | 3,337 | | 1,744 | | 9,746 |
| Transporters..... | 91 | | | | | | 91 |
| Shoersmen..... | 110 | | 255 | | 129 | | 494 |
| Total..... | 4,866 | | 3,592 | | 1,873 | | 10,331 |
| Fishermen, classified by methods used: | | | | | | | |
| Crowfoot bars..... | 2,793 | | 2,216 | | 1,452 | | 6,461 |
| Forks..... | 364 | | 1,116 | | 313 | | 1,793 |
| Tongs..... | 1,232 | | 513 | | 24 | | 1,769 |
| Diggers..... | | | 140 | | 11 | | 151 |
| Dredgers..... | 43 | | 63 | | | | 106 |
| Rakes..... | 21 | | 93 | | 89 | | 203 |
| Scoops, or basket rakes..... | | | | | 25 | | 25 |
| Miscellaneous apparatus..... | | | 13 | | | | 13 |
| Waders..... | 1,051 | | 944 | | 268 | | 2,263 |
| Total, exclusive of duplication..... | 4,665 | | 3,337 | | 1,744 | | 9,746 |
| Boats and vessels: | | | | | | | |
| Rowboats and barges..... | 4,276 | \$26,631 | 2,199 | \$16,712 | 1,055 | \$14,860 | 7,530 |
| Gasoline boats..... | 446 | 59,545 | 1,031 | 87,320 | 749 | 74,950 | 2,226 |
| House-boats..... | 579 | 46,990 | 115 | 14,610 | 55 | 6,595 | 749 |
| Vessels transporting..... | 25 | 56,265 | | | | | 25 |
| Total..... | 5,326 | 189,431 | 3,345 | 118,642 | 1,859 | 96,405 | 10,530 |
| Apparatus: | | | | | | | |
| Crowfoot bars.....pairs | 2,795 | 31,896 | 2,212 | 24,395 | 1,488 | 17,840 | 6,495 |
| Forks..... | 364 | 427 | 1,103 | 1,441 | 313 | 456 | 1,780 |
| Tongs..... | 1,245 | 7,321 | 513 | 2,796 | 14 | 70 | 1,772 |
| Diggers..... | | | 102 | 658 | 34 | 174 | 136 |
| Dredges..... | 19 | 1,500 | 36 | 63 | | | 55 |
| Rakes..... | 21 | 58 | 85 | 119 | 79 | 95 | 185 |
| Scoops, or basket rakes..... | | | | | 15 | 67 | 272 |
| Miscellaneous apparatus..... | | | | 9 | | | 67 |
| Total..... | | 41,202 | | 29,481 | | 18,702 | |
| Shore and accessory property..... | | 10,853 | | 18,732 | | 17,160 | |
| Total investment..... | | 241,486 | | 166,855 | | 132,267 | |
| Products: | | | | | | | |
| Shells— | | | | | | | |
| With crowfoot bars.tons. | 14,531 | 210,521 | 15,258 | 245,477 | 6,524 | 120,859 | 36,313 |
| With forks.....do. | 1,277 | 15,233 | 3,292 | 55,757 | 852 | 12,138 | 5,421 |
| With tongs.....do. | 3,201 | 55,568 | 790 | 13,559 | 54 | 1,100 | 4,045 |
| With diggers.....do. | | | 1,733 | 28,200 | 105 | 1,673 | 1,838 |
| With dredges.....do. | 303 | 5,091 | 225 | 4,500 | | | 528 |
| With rakes.....do. | 24 | 379 | 161 | 2,856 | 206 | 4,019 | 391 |
| With scoops, or basket rakes.....tons. | | | | | 232 | 3,162 | 232 |
| With miscellaneous apparatus.....tons. | | | 34 | 453 | | | 34 |
| With hands.....do. | 379 | 7,764 | 1,824 | 31,408 | 566 | 6,009 | 2,769 |
| Total..... | 19,715 | 294,606 | 23,317 | 382,210 | 8,539 | 148,960 | 51,571 |
| Pearls..... | | 149,121 | | 164,261 | | 62,902 | |
| Total value of products..... | | 443,727 | | 546,471 | | 211,862 | |
| | | | | | | | 1,202,060 |

^a From Statistical Bulletin 305. This includes Neosho River, Kans.^b From Statistical Bulletin 314. This does not include tributaries of the Ohio River in Ohio, data for which were shown in Statistical Bulletin 305.^c From Statistical Bulletin 343. This does not include the Neosho River, Kans., data for which were shown in Statistical Bulletin 305.^d Obtained by combining statistics for the three sections of the Mississippi Valley for 1912, 1913, and 1914, respectively.^e Includes 56 women.^f Includes 253 women.^g Includes 118 women.

FISHERIES OF LAKE PEPIN AND LAKE COOPER.

Lake Pepin.—Lake Pepin, an expansion of the Mississippi River between Minnesota and Wisconsin, is nearly 25 miles long and 3 miles wide at its greatest breadth. It supports quite extensive fisheries. Pepin, Wis., is the most important town in the extent of its fisheries along the lake. Maiden Rock, Wis., also supports important fisheries.

In 1914 there were 137 fishermen engaged in the industry, their total investment amounting to \$43,599. The investment included 28 gasoline boats, worth \$7,625; 53 rowboats, valued at \$1,300; 1 house-boat, valued at \$100; 295 fyke nets, valued at \$24,995; 14 seines, valued at \$3,340; 664 anchored gill nets, valued at \$4,421; 8 trap nets, with a value of \$480; \$3 worth of lines, and \$1,335 worth of shore and accessory property. The total output of the lake amounted to 758,670 pounds of fish, with a value to the fishermen of \$33,719. Buffalofish, German carp, fresh-water drum, and catfish made up 94 per cent of the value of the entire catch. The most important apparatus used was the fyke net, known locally as hoop net. The catch therewith amounted to 337,446 pounds of fish, valued at \$18,973. The leading species included in the catch were buffalofish, fresh-water drum, German carp, suckers, and quillbacks, or white carp. Seines ranked next in importance with a catch of 291,216 pounds of fish, having a value of \$8,219. German carp and buffalofish were the two leading species taken, the value of the two being more than three-fourths that of the entire seine catch. The catch by anchored gill nets amounted to 126,198 pounds, valued at \$6,432. As in the case of seines, the principal species taken were the buffalofish and German carp. Trap nets and lines were also used, but the combined catch of the two amounted to only 3,810 pounds, with a value of \$95.

The fishery conditions on Lake Pepin have improved very much within the past 15 years by the opening up of the New York market during the winter season. Previously there was only a local demand for the fish. A considerable portion of the winter fishing is done through the ice. Comparatively few fish are handled during warm weather, as the demand is then very light. There is a close season along the lake in both Minnesota and Wisconsin from April 15 to June 15.

Lake Cooper.—Lake Cooper, which is merely a widening of the Mississippi River formed by back water from the dam at Keokuk, Iowa, has a length of about 50 miles.

There was a total of 105 men engaged in the fisheries of this lake during 1914. These men had an investment of \$16,190, and caught 661,135 pounds of fish, valued at \$23,300. Buffalofish, German carp, and catfish contributed 94 per cent of the value of the total catch. The most important form of apparatus used was the fyke net, known locally as bait net. The catch by this form of net amounted to 488,005 pounds, valued at \$16,210. The remainder of the catch was taken with lines and trammel nets. The most important species taken both in fyke nets and trammel nets were German carp and buffalofish. Catfish and German carp constituted the principal species taken on lines.

The form of fyke net in general use on Lake Cooper is much smaller than those used on Lake Pepin, having neither leader, wings, nor

heart, as have most of those on the latter lake. The Lake Cooper fyke nets have from 4 to 7 hoops, $2\frac{1}{2}$ feet in diameter. There was one set in the lake opposite Sandusky, Iowa, in 1914, however, which had 9 hoops, the largest being 11 and the smallest 7 feet in diameter. The total length of this net was 57 feet.

FISHERIES OF LAKE PEPIN AND LAKE COOPER (MISSISSIPPI RIVER) IN 1914.

| Items. | Lake Pepin. | | Lake Cooper. | |
|---------------------------------------|-------------|---------|--------------|---------|
| | Number. | Value. | Number. | Value. |
| Persons engaged: | | | | |
| Fishermen..... | 135 | ..... | 105 | ..... |
| Shoersmen..... | 2 | ..... | ..... | ..... |
| Total..... | 137 | ..... | 105 | ..... |
| Boats, apparatus, and other property: | | | | |
| Gasoline boats..... | 28 | \$7,625 | 36 | \$3,870 |
| Rowboats..... | 53 | 1,300 | 84 | 1,250 |
| House-boats..... | 1 | 100 | 10 | 1,075 |
| Fyke nets..... | 295 | 24,995 | 1,378 | 5,693 |
| Seines..... | 14 | 3,340 | ..... | ..... |
| Anchored gill nets..... | 664 | 4,421 | ..... | ..... |
| Trammel nets..... | ..... | ..... | 14 | 304 |
| Trap nets..... | 8 | 480 | ..... | ..... |
| Trot and hand lines..... | ..... | 2 | ..... | 153 |
| Shore and accessory property..... | ..... | 1,535 | ..... | 3,845 |
| Total..... | 43,599 | ..... | 16,190 | ..... |
| Products by apparatus: | | | | |
| With seines— | | | | |
| Buffalo fish..... | 13,550 | 2,354 | ..... | ..... |
| Catfish..... | 11,785 | 738 | ..... | ..... |
| Fresh-water drum..... | 42,150 | 400 | ..... | ..... |
| German carp..... | 137,920 | 3,967 | ..... | ..... |
| Mooneye, fresh..... | 3,000 | 25 | ..... | ..... |
| Mooneye, smoked..... | 365 | 16 | ..... | ..... |
| Quillback, or white carp..... | 45,775 | 459 | ..... | ..... |
| Spoonbill cat, or paddlefish..... | 2,205 | 138 | ..... | ..... |
| Sturgeon, lake..... | 616 | 73 | ..... | ..... |
| Suckers..... | 3,850 | 49 | ..... | ..... |
| Total..... | 291,216 | 8,219 | ..... | ..... |
| With fyke nets— | | | | |
| Buffalo fish..... | 173,450 | 14,068 | 232,585 | 8,615 |
| Catfish..... | 10,975 | 743 | 18,415 | 1,258 |
| Crappie..... | ..... | ..... | 50 | 3 |
| Dogfish..... | 1,534 | 16 | ..... | ..... |
| Fresh-water drum..... | 85,000 | 1,964 | 21,455 | 642 |
| German carp..... | 30,547 | 1,228 | 209,715 | 5,456 |
| Mooneye, fresh..... | 6,300 | 63 | ..... | ..... |
| Mooneye, smoked..... | 1,100 | 54 | ..... | ..... |
| Quillback, or white carp..... | 13,305 | 378 | ..... | ..... |
| Spoonbill cat, or paddlefish..... | 340 | 19 | ..... | ..... |
| Sturgeon, lake..... | 405 | 50 | 1,095 | 69 |
| Suckers..... | 14,490 | 390 | 4,640 | 164 |
| Sunfish..... | ..... | ..... | 50 | 3 |
| Total..... | 337,446 | 18,973 | 488,005 | 16,210 |
| With anchored gill nets— | | | | |
| Buffalo fish..... | 44,250 | 3,306 | ..... | ..... |
| Catfish..... | 3,760 | 244 | ..... | ..... |
| Fresh-water drum..... | 1,235 | 21 | ..... | ..... |
| German carp..... | 69,050 | 2,428 | ..... | ..... |
| Quillback, or white carp..... | 1,525 | 27 | ..... | ..... |
| Spoonbill cat, or paddlefish..... | 6,332 | 400 | ..... | ..... |
| Sturgeon, lake..... | 46 | 6 | ..... | ..... |
| Total..... | 126,198 | 6,432 | ..... | ..... |
| With trammel nets— | | | | |
| Black bass..... | ..... | ..... | 15 | 1 |
| Buffalo fish..... | ..... | ..... | 15,230 | 543 |
| Catfish..... | ..... | ..... | 1,055 | 69 |
| Crappie..... | ..... | ..... | 20 | 1 |
| Fresh-water drum..... | ..... | ..... | 3,065 | 108 |
| German carp..... | ..... | ..... | 61,885 | 1,408 |
| Sturgeon, lake..... | ..... | ..... | 675 | 40 |
| Total..... | ..... | ..... | 81,945 | 2,170 |

FISHERIES OF LAKE PEPIN AND LAKE COOPER (MISSISSIPPI RIVER) IN 1914—Con.

| Items. | | Lake Pepin. | Lake Cooper. |
|-----------------------------------|---------|-------------|--------------|
| | Number. | Value. | Number. |
| Products by apparatus—Continued. | | | |
| With trap nets— | | | |
| Catfish..... | 235 | \$15 | ..... |
| Fresh-water drum..... | 3,400 | 65 | ..... |
| Total..... | 3,635 | 80 | ..... |
| With trot and hand lines— | | | |
| Buffalo fish..... | pounds. | | |
| Catfish..... | do. | 2,085 | \$94 |
| Eels..... | do. | 52,065 | 3,528 |
| Fresh-water drum..... | do. | 3,800 | 230 |
| German carp..... | do. | 2,310 | 77 |
| Pike..... | do. | 30,765 | 959 |
| Sturgeon, lake..... | do. | 130 | 12 |
| Sunfish..... | do. | 50 | 5 |
| Total..... | 175 | 15 | 91,185 |
| Grand total..... | 758,670 | 33,719 | 661,135 |
| Product by species: | | | |
| Black bass..... | pounds. | 15 | 1 |
| Buffalo fish..... | do. | 211,250 | 19,728 |
| Catfish..... | do. | 26,830 | 1,745 |
| Crappie..... | do. | 71,535 | 4,855 |
| Dogfish..... | do. | 70 | 4 |
| Eels..... | do. | 1,534 | 16 |
| Fresh-water drum..... | do. | 3,800 | 250 |
| German carp..... | do. | 131,785 | 2,450 |
| Mooneye, frsh..... | do. | 237,517 | 7,623 |
| Mooneye, smoked..... | do. | 302,365 | 7,823 |
| Pike..... | do. | 9,300 | 88 |
| Quillback, or white carp..... | do. | 1,465 | 70 |
| Spoonbill cat, or paddlefish..... | do. | 50 | 5 |
| Sturgeon, lake..... | do. | 60,605 | 864 |
| Suckers..... | do. | 8,877 | 557 |
| Sunfish..... | do. | 1,067 | 129 |
| Total..... | 18,340 | 439 | 4,610 |
| | do. | 50 | 50 |
| | | | 3 |
| | | 758,670 | 33,719 |
| | | 661,135 | 23,300 |

CRAB INDUSTRY OF MARYLAND AND VIRGINIA.

The blue crab is one of the most valuable fishery resources of Chesapeake Bay. In no other body of water is this species so abundant and important. The increasing magnitude of the fishery has occasioned much concern among those solicitous for its future welfare, and there has been much discussion of the necessity for restrictive measures in Maryland and Virginia. The Bureau desired to give the States full and reliable data on which to base any needed action; and accordingly it placed its agents in the field on November 15, 1915, and on December 21, 1915, was able to issue a printed bulletin containing detailed statistics of the industry for the calendar year 1915. This bulletin, which was very favorably received because of its timely appearance and valuable contents, was distributed to State legislators and fishery officials, to crab fishermen, dealers, and canners, and to all other interested persons.

In Maryland the growth of the hard-crab industry has been quite marked during the past few years, owing to the increasing number of firms engaged in shipping crab meat. The soft-crab fishery has scarcely more than held its own. The crab industry of this State in 1915 gave employment to 7,312 persons, of whom 4,053 were engaged in the shore or boat fisheries, 41 in fishing and transporting vessels, and 3,218 in the wholesale trade and canning industry. The invest-

ment in vessels, boats, fishing apparatus, and shore and accessory property was \$485,627. The wages paid in the wholesale and canning trades amounted to \$191,840. The catch aggregated 90,281,646 crabs in number, or 30,093,882 pounds, valued at \$664,651. This includes 22,491,675 pounds of hard crabs, valued at \$335,375, and 7,602,207 pounds of soft crabs, valued at \$329,276. The hard crabs were taken chiefly with trot lines, and smaller quantities with scrapes and scoop nets. The greater part of the catch of soft crabs was taken with scrapes and scoop nets, and the remainder with trot lines and seines.

Crisfield still remains the center of both soft and hard crab industries, about three-fourths of the entire crab catch of the State being handled and shipped from that place in a live condition or as crab meat. Many soft crabs are also brought here for shipment in the early spring from the western shore of Virginia. In 1915 there were 47 firms in Crisfield and immediate vicinity handling soft crabs only, 17 firms handling hard crabs only, 2 firms handling both soft and hard crabs, and 1 firm which canned soft crabs. Several of the soft-crab firms had branch houses at various localities throughout Somerset and Dorchester Counties, Md., and Accomac County, Va., their products being brought to Crisfield for shipment. Most of the crabs caught on the western shore of Maryland are also brought by gasoline boats to Crisfield for shipment. With the exception of a few shipped by steamer for consumption in Baltimore, practically all of the soft crabs are sent by express from Crisfield.

Somerset County leads all other counties in the production of crabs, the value of its output to the fishermen in 1915 amounting to \$365,498, as compared with \$130,136 for Dorchester, \$106,480 for Talbot, \$18,695 for Queen Anne, \$14,210 for Anne Arundel, \$12,385 for Kent, \$4,900 for Calvert, \$3,425 for St. Mary, \$1,850 for Wicomico, \$1,670 for Charles, and \$1,000 for Baltimore. The value of the hard-crab industry far exceeds that of the soft-crab industry in all of the above counties except Somerset, where the conditions are reversed. All of the soft crabs except a few used for canning at Crisfield are shipped alive, while most of the hard crabs are utilized in the extraction of the meat, which is packed and shipped in tin buckets. There were only 3 firms in the State canning crabs in 1915, 2 of these handling hard and 1 soft crabs; the combined output of these firms was 179,976 cans, including a few glass jars, having a value of \$33,759.

The crab industry of Virginia employed 2,978 persons and \$367,150 in invested capital. The catch amounted to 60,748,158 crabs in number, or 20,249,386 pounds, valued at \$317,156; of these, 18,765,148 pounds, valued at \$242,754, were hard crabs, and the remainder, 1,484,238 pounds, valued at \$74,402, were soft crabs. The most important apparatus used for crabs in Virginia is the trot line, which took 14,042,861 pounds, valued at \$135,817; dredges are next, with a catch of 4,196,000 pounds, valued at \$94,928; the remaining hard crabs were taken by means of scrapes and scoop nets. Scoop nets constitute the most important apparatus used in the soft-crab fishery, the catch with these amounted to 867,797 pounds, valued at \$47,362; scrapes are next in importance with 616,441 pounds, valued at \$27,040.

Considering the relative importance of this industry by counties, Elizabeth City County ranks first with 5,040,840 pounds, valued at \$78,533; Accomac County is next with 4,352,612 pounds, valued at \$96,130. The former county has an excess of 688,228 pounds over the latter, but the value is \$17,597 less. This is explained by the fact that Accomac County has quite an important soft-crab fishery, while Elizabeth City County has only hard crabs. The third in importance is York County, with 2,204,800 pounds, valued at \$27,504; the fourth is Mathews County, with 1,997,760 pounds, valued at \$18,221; the fifth is Norfolk County, with 1,959,000 pounds, valued at \$21,772; the sixth is Northampton County, with 1,050,264 pounds, valued at \$24,587. The remaining counties have less than 1,000,000 pounds each. Accomac County leads in the production of soft crabs, the catch this year being 1,150,996 pounds, valued at \$50,645. Northumberland County leads the western-shore counties in the production of soft crabs, the catch amounting to 166,390 pounds, valued at \$12,564; Lancaster County, the next in point of importance, shows a catch amounting to 78,720 pounds, valued at \$5,928. Great Wicomico River region in the former county and Corrotoman River, a branch of Rappahannock River, in the latter county are regarded as quite productive and remunerative soft-crab waters, rendered more remunerative, probably, because of the fact that the soft crabs appear here earlier than on the eastern shore, in the Tangier Sound region, and the Crisfield dealers send boats over in the early spring for the catch.

Crab fishing usually starts in Northumberland and Lancaster Counties about the 15th or 20th of April, while the soft-crab season about Crisfield does not begin until about the middle of May. The catch, as well as the demand, diminishes about the early part of June, and many of the fishermen then seek other employment, although the Crisfield boats continue the trips practically throughout the season. These boats also call at other points on the western shore to make crab collections. Trot-line fishing is carried on with more or less importance in every county along both the eastern and western shores, but at many points on the latter side the fishermen lack good shipping facilities, the only outlet being to Baltimore by steamer, and crabs thus shipped from some places one morning do not reach their destination until the following morning. Many of the York County fishermen go to the lower part of the bay, where they consider the fishing grounds to be more productive, and sell their catch to Hampton. Some little trot-line fishing is carried on by Princess Anne County fishermen living about Lynnhaven Inlet. They start in Lynnhaven River in early spring, before the crabs begin moving about, and get good prices for their early catch, but when the Hampton fishermen begin fishing the price usually drops, and as the Lynnhaven fishermen are handicapped for want of convenient market they have about all abandoned crab fishing by early June. Hampton is, by far, the most important locality in the State for the crab industry, 33 of the 56 vessels hailing from this region. There are 15 wholesale dealers here, 2 of whom handle canned crab meat. These dealers take practically the entire catch of the dredge boats in addition to the trot-line catch of this (Elizabeth City) and other counties.

Crabs are canned only during the summer months, and the crabs used for this purpose are consequently taken by trot lines. The line fishing begins as soon as the water becomes warm enough to cause the crabs to move from the mud in which they have been bedded for the winter for protection from the cold, usually some time in April or early May, and continues through the summer until the cold forces the crabs to again seek the mud bottom. In some sections, however, the line fishing slackens during the extremely hot summer months, this being especially true of those places where the shipping facilities are not favorable. The dredging season usually opens some time during November, usually about the middle of the month, as soon as the crabs have bedded, and extends throughout the winter until the water warms sufficiently to start the crabs from their winter beds. Dredging is mostly done in the lower part of the bay, and sometimes outside the capes when the sea is not too rough. The entire winter catch is picked and sold as fresh meat. Crab meat weighs 5 pounds to the gallon, and an average of 7 crabs will yield 1 pound of meat.

A table showing the details of the industry in Maryland and Virginia follows. There are given also comparative statistics of the catch for a number of years, beginning with 1880. The output in 1915 was the largest for any year for which data are available, and the value then was 50 per cent more than in 1908, the last previous year for which the Bureau had collected complete returns. The information at hand, however, points to a catch in 1915 much short of that a few years before, and the climax of the fishery seems to have been reached about 1912.

CRAB INDUSTRY OF MARYLAND AND VIRGINIA, 1915.

| Items. | Maryland. | | Virginia. | | Total. | |
|--|-----------|---------|-----------|-----------|-----------|-----------|
| | Number. | Value. | Number. | Value. | Number. | Value. |
| Persons engaged: | | | | | | |
| On vessels fishing..... | 33 | | 189 | | 222 | |
| On vessels transporting..... | 8 | | | | 8 | |
| In shore or boat fisheries..... | 4,053 | | 1,922 | | 5,975 | |
| Shoersmen..... | 3,218 | | 867 | | 4,085 | |
| Total..... | 7,312 | | 2,978 | | 10,290 | |
| Vessels, boats, apparatus, and other property: | | | | | | |
| Vessels fishing..... | 16 | \$5,450 | 56 | \$139,100 | 72 | \$144,550 |
| Net tonnage..... | 94 | | 497 | | 591 | |
| Vessels transporting..... | 4 | 4,200 | | | 4 | 4,200 |
| Net tonnage..... | 26 | | | | 26 | |
| Gasoline boats..... | 1,304 | 181,475 | 283 | 61,160 | 1,587 | 242,635 |
| Sail and row boats..... | 3,053 | 119,245 | 1,693 | 28,774 | 4,746 | 148,019 |
| Apparatus vessel fisheries: | | | | | | |
| Dredges..... | | | 182 | 4,511 | 182 | 4,511 |
| Scrapes..... | 71 | 183 | 18 | 54 | 99 | 237 |
| Apparatus shore fisheries: | | | | | | |
| Dredges..... | | | 30 | 720 | 30 | 720 |
| Scrapes..... | 2,484 | 7,452 | 250 | 710 | 2,734 | 8,162 |
| Scoop nets..... | 1,770 | 874 | 641 | 317 | 2,411 | 1,191 |
| Trot lines..... | 1,525 | 8,741 | 1,139 | 7,449 | 2,664 | 16,190 |
| Seines..... | 29 | 111 | | | 29 | 111 |
| Shore and accessory property..... | | 157,896 | | 124,355 | | 282,251 |
| Total..... | | 485,627 | | 367,150 | | 852,777 |
| Products: | | | | | | |
| Vessel fisheries— | | | | | | |
| With dredges—Hard crabs, pounds..... | | | 3,596,400 | 81,246 | 3,596,400 | 81,246 |
| With scrapes— | | | | | | |
| Hard crabs.....pounds..... | 26,962 | 577 | 11,804 | 265 | 38,766 | 842 |
| Soft crabs.....do..... | 85,772 | 3,875 | 52,332 | 2,355 | 138,104 | 6,230 |
| Total..... | 112,734 | 4,452 | 3,660,536 | 83,866 | 3,773,270 | 88,318 |

CRAB INDUSTRY OF MARYLAND AND VIRGINIA, 1915—Continued.

| Items. | Maryland. | | Virginia. | | Total. | |
|---|-------------|----------|------------|----------|------------|----------|
| Products—Continued. | | | | | | |
| Shore fisheries— | | | | | | |
| With dredges—Hard crabs, pounds. | Number. | Value. | Number. | Value. | Number. | Value. |
| With scrapes— | | | 599,600 | \$13,682 | 599,600 | \$13,682 |
| Hard crabs.....pounds..... | 1,444,435 | \$25,190 | 219,086 | 5,063 | 1,663,521 | 30,253 |
| Soft crabs.....do..... | 3,601,394 | 152,626 | 564,109 | 24,685 | 4,165,503 | 177,311 |
| With scoop nets— | | | | | | |
| Hard crabs.....do..... | 1,100,422 | 20,908 | 295,397 | 6,681 | 1,395,819 | 27,589 |
| Soft crabs.....do..... | 3,530,898 | 157,024 | 867,797 | 47,362 | 4,398,695 | 204,386 |
| With trot lines— | | | | | | |
| Hard crabs.....do..... | 19,919,856 | 288,700 | 14,042,861 | 135,817 | 33,962,717 | 424,517 |
| Soft crabs.....do..... | 364,877 | 14,266 | ..... | ..... | 364,877 | 14,266 |
| With seines—Soft crabs..do..... | 19,266 | 1,485 | ..... | ..... | 19,266 | 1,485 |
| Total..... | 29,951,148 | 660,199 | 16,588,850 | 233,290 | 46,569,998 | 893,459 |
| Grand total..... | 230,093,882 | 664,651 | 20,249,386 | 317,156 | 50,343,268 | 981,807 |
| Wholesale and canning trade: | | | | | | |
| Wages..... | | 191,840 | ..... | 67,012 | ..... | 258,852 |
| Barrels, boxes, cans, and packing materials used..... | | 104,529 | ..... | 38,553 | ..... | 143,082 |
| Crabs canned.....cans..... |  | ..... | ..... | ..... | 478,104 | 91,465 |

^a 90,281,646 in number.^b 60,748,158 in number.^c 151,029,804 in number.

COMPARATIVE STATISTICS OF THE CRAB PRODUCT OF MARYLAND AND VIRGINIA FOR VARIOUS YEARS FROM 1880 TO 1915.

| Year. | Maryland. | | | | | |
|-------------------------|--------------|----------|--------------|-----------|------------|----------|
| | Crabs, hard. | | Crabs, soft. | | Total. | |
| | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. |
| 1880..... | 1,166,667 | \$46,850 | (a) | (a) | 1,166,667 | \$46,850 |
| 1887..... | 2,757,638 | 36,969 | 1,636,530 | \$133,788 | 4,394,168 | 170,757 |
| 1888..... | 2,674,675 | 37,438 | 2,208,829 | 161,331 | 4,883,504 | 198,769 |
| 1890..... | 2,388,099 | 31,723 | 4,056,110 | 228,690 | 6,444,209 | 260,413 |
| 1891..... | 2,776,898 | 37,460 | 4,828,872 | 266,256 | 7,605,770 | 303,716 |
| 1897..... | 5,333,316 | 39,949 | 4,115,879 | 177,637 | 9,449,195 | 217,586 |
| 1901..... | 9,824,793 | 85,884 | 4,303,582 | 202,563 | 14,128,375 | 288,447 |
| 1904..... | 12,665,282 | 168,996 | 5,732,805 | 189,851 | 18,398,147 | 358,847 |
| 1908 ^b | 12,786,000 | 124,000 | 7,587,000 | 195,000 | 20,373,000 | 319,000 |
| 1915..... | 22,491,675 | 335,375 | 7,602,207 | 329,276 | 30,093,882 | 664,651 |

| Year. | Virginia. | | | | | |
|-------------------------|--------------|----------|--------------|----------|------------|----------|
| | Crabs, hard. | | Crabs, soft. | | Total. | |
| | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. |
| 1880..... | 2,139,200 | \$32,088 | (a) | (a) | 2,139,200 | \$32,088 |
| 1887..... | 626,820 | 15,479 | (a) | (a) | 626,820 | 15,479 |
| 1888..... | 956,843 | 24,669 | (a) | (a) | 956,843 | 24,669 |
| 1890..... | 2,584,794 | 28,210 | 440,310 | \$26,054 | 3,025,104 | 54,264 |
| 1891..... | 2,208,071 | 32,683 | 585,956 | 29,379 | 2,794,027 | 62,062 |
| 1897..... | 5,331,398 | 28,331 | 1,068,116 | 39,914 | 6,399,514 | 68,245 |
| 1901..... | 6,113,277 | 52,863 | 1,288,424 | 65,972 | 7,401,701 | 118,835 |
| 1904..... | 10,356,052 | 179,575 | 1,910,654 | 92,909 | 12,266,706 | 272,484 |
| 1908 ^b | 23,001,000 | 239,000 | 2,082,000 | 87,000 | 25,083,000 | 326,000 |
| 1915..... | 18,765,148 | 242,754 | 1,484,238 | 74,402 | 20,249,386 | 317,156 |

^a Statistics not available.^b The statistics for 1908 are from data published by the Bureau of the Census.

SHAD AND ALEWIFE INDUSTRY OF CHESAPEAKE BAY AND TRIBUTARIES.

In view of the large interests dependent on the perpetuation of the supply of shad and alewives, or river herring, in the Chesapeake Basin, the Bureau in 1915 made a complete canvass of the industries connected with these fishes, for the purpose of being in position to substantiate the often expressed opinion that radical action was demanded of the States in order to prevent commercial extermination. The results of the canvass were promptly published in a statistical bulletin, which was at once sent to the governors and legislators of Maryland and Virginia, accompanied by three large charts showing the actual location of each pound net and gill net set for shad in 1915 on certain sections of the western shore of Virginia. The data thus supplied are thought to have influenced the Virginia Legislature, in its closing hours, to pass an act, effective in 1917, which will have the effect of permitting a larger portion of the run of spawning fish to reach their spawning grounds. This act, if its object is realized, will supplement in an effective way the protection that has heretofore been afforded to the migrating fish by the War Department through the insistence that certain lanes for navigational purposes shall be left in the maze of set nets on the shores of Chesapeake Bay and its major tributaries.

The fishery for alewives is closely connected with that for shad, the same apparatus being used and the seasons being coincident. The canvass therefore included the alewives as well as the shad, and the published bulletin, herein reprinted, gives the statistics of both fisheries.

The catch of shad in Maryland in 1915, compared with that of 1909, the latest previous year for which statistics are available, declined more than 50 per cent in quantity and about 29 per cent in value, and the catch of alewives decreased nearly 47 per cent in quantity and about 15 per cent in value. Chesapeake Bay, in Maryland, showed a decline of about 45 per cent in the shad catch and 31 per cent in the alewife catch. A still larger decrease occurred in some of the more important rivers. In the Susquehanna River, in Maryland and Pennsylvania, there was a decrease of 88 per cent in the shad and 88 per cent in the alewife catch. In the Choptank River and tributaries there was a decrease of 83 per cent in the catch of shad and 84 per cent in that of alewives. In the Potomac River the shad catch decreased 11 per cent and the alewife catch 74 per cent. In the Northeast River, which was the only one of importance which did not show a decided decline in these species, the catch of shad fell off less than 10 per cent and that of alewives increased 47 per cent.

The catch of shad in the Patuxent River in 1915 amounted to 1,118 in number, compared with 7,485 in 1909, 9,577 in 1904, 43,000 in 1901, and 52,354 in 1896, the only years for which statistics are available. The alewife catch fell off from 796,300 in 1909 to 20,400 in 1915.

The Elk River has never been a prolific shad stream, but has always furnished large quantities of alewives. The largest output of shad was in 1904, when 8,850 were taken. The catch of alewives in this river was 6,736,000 in 1909 and 3,608,950 in 1915.

The decreased run of shad and alewives in the Chesapeake Bay basin of Maryland, Delaware, and Pennsylvania in 1915 resulted in a noticeable decline in the amount of all forms of apparatus used for their capture.

In Virginia the catch of shad in 1915, compared with 1909, decreased 1,316,066 pounds, or 21.82 per cent in quantity, but increased \$169,674, or 34.74 per cent, in value, and the catch of alewives decreased 11,733,850 pounds, or 42.22 per cent in quantity, and increased \$37,575, or 29.26 per cent, in value.

The pound nets fished in Virginia in these waters during the season of 1915, compared with 1909, show a decrease of 31, but the number of gill nets increased from 7,121 in 1909 to 16,793 in 1915. The total catch of shad in Virginia during the year was 1,629,872 in number, or 4,714,134 pounds, valued at \$658,010, and that of alewives was 40,135,328 in number, or 16,054,130 pounds, valued at \$165,950.

In the Potomac River there were but two seines fished during the season of 1915 for herring and shad—one on the Maryland side at Chapmans Point and the other on the Virginia side at Stony Point. There are very few pound nets along the Maryland side of this river, but quite a number of large traps on the Virginia side off Northumberland County near the mouth. The alewife fisheries of Westmoreland County were quite extensive up to a few years ago, and it was in this county that the canning of the roe originated. Several large packing houses were located in this county as recently as 1909, but now there is but one, and that very small. There are a number of large packing houses in that part of Northumberland County bordering on the Potomac, or rather in Coan River and Yeocomico River, which are tributary to the Potomac. Both alewives and roe are packed in large quantities at these points. Drift gill nets are not fished for shad below Maryland Point, and from this place they are used in various locations up to Jones Point, a short distance below Alexandria. The gill-net catch of 1915 was reported by fishermen as the lightest they had ever taken, and many of them made little more than expenses. Some fishermen of Northumberland County along the Potomac reported the herring and shad catch for 1915 as very gratifying and thought that it was the best they have had for several seasons.

The total number of pound nets fished in Virginia during the year was 2,012, valued at \$408,675. Of these, 527, or about 26 per cent, valued at \$107,200, were fished by Mathews County fishermen. Elizabeth City County ranks second in the number of pound nets, having 317, valued at \$73,900; Accomac County third, with 273 nets, valued at \$48,150; followed by Northumberland County with 269, valued at \$73,250, and Gloucester County with 204, valued at \$33,100.

The catch for 1915 showed a great many more bucks than for the average year, and many of these were smaller than usual. This seemed to be the case on all parts of the bay.

In the James River stake gill nets are the leading form of apparatus used for shad fishing. The only drifting grounds remaining are located quite a distance up the river, and the catch with drift nets was negligible in the 1915 season. During the summer of 1909, when a canvass of the shad fisheries was made on this river, very few stake nets were found above Ferguson's Wharf, now called Rushmere, located in Isle of Wight County about 12 miles above Newport News.

Such nets are now found at various points up as far as Tar Bay, near Coggins Point, within a short distance of the mouth of Appomattox River. The shad run appeared in 1915 about March 15 to 20, though a few stray fish were seen earlier, and the gill-net fishing was practically over by the third or fourth week in May. Gill nets can not be used after the water is warm enough to start the crabs, as these hang in the nets and interfere too much with the handling of them. The run was much lighter than usual, but the greater part of the gill-net catch was roe fish, and the high price received partly made up for the decrease in the catch.

The apparatus used in the Chickahominy River consists entirely of seines and drift gill nets, and the catch includes shad and other species. Pound nets are not permitted in this river.

In the Rappahannock River stake gill nets having $2\frac{3}{4}$ -inch mesh are fished during the winter for perch and discontinued when the shad season opens. The shad nets are then used on the same stands, being the same length as the perch nets but of a larger mesh. Herring do not usually figure in the catch of the perch nets, but there was an early run of branch herring in 1915 and some of the nets made fairly good catches. The fishermen received as high as \$20 per thousand for these early herring. Some herring are caught also in the small pound nets in this river, and the average price for these was about \$10 per thousand.

The number of persons engaged in the shad and alewife industries of Chesapeake Bay and tributaries in 1915 was 8,839, of whom 6,612 were fishermen and 2,227 were employed in shore industries. The investment in boats, fishing apparatus, shore and accessory property, and cash capital amounted to \$1,528,824. The products of these fisheries aggregated 2,129,486 shad in number, or 6,225,549 pounds, valued at \$857,771, and 71,571,278 alewives in number, or 28,628,510 pounds, valued at \$297,899, a total value for both species of \$1,155,670. Compared with the returns for 1909, there was a decrease of 258 in the number of pound nets and an increase of 7,968 in the number of gill nets operated. The catch of shad decreased 3,114,219 pounds, but increased \$88,322 in value, and the catch of alewives decreased 22,803,590 pounds and increased \$13,855 in value.

Statistics by States of the shad and alewife industry of Chesapeake Bay and tributaries in 1915, and also comparative statistics for Maryland and Virginia for various years from 1880 to 1915, and by waters for certain years from 1896 to 1915, are given in detail in the following tables.

SHAD AND ALEWIFE INDUSTRY OF CHESAPEAKE BAY AND TRIBUTARIES, 1915.

| | | | | | | |
|---|-----------|-----------|---------|-----------|-----------|----------------------------|
| Wholesale and canning trade: | | | | | | |
| Wages..... | | | | | | 65,886 |
| Barrels, boxes, cans, and salt used..... | | | | | | 88,347 |
| Salt alewives (herring), barrels..... | 20,227 | 4,091,400 | 103,278 | 35,938 | 7,191,000 | 56,185,111,283,000 |
| | 1,634,300 | 639,720 | 8,844 | 7,237,700 | 2,895,080 | 45,162,8,892,000 |
| Canned alewives (herring), cans..... | 27,144 | 24,033 | 1,331 | ..... | 27,144 | 24,093 |
| Canned alewives (herring), cans..... | 351,888 | 374,404 | 34,046 | 839,160 | 944,055 | 83,321,1,191,048,1,318,459 |
| | | | | | | 117,367 |

Includes one steamer valued at \$2 500

Includes one steamer valued at \$2,150.

**COLLECTED AND ARRANGED
SYNTHETICALLY
ON THE SHAD AND ALEWIFE PRODUCT OF MARYLAND AND VIRGINIA FOR VARIOUS YEARS FROM 1880 TO 1913.**

the coasts of both the Chesapeake Bay region is included for some years, but is practically negligible.

The catch of salmon and alluvium in this table are from data published by the Bureau of the Census.

COMPARATIVE STATISTICS OF THE APPARATUS USED IN THE SHAD AND ALEWIFE FISHERIES OF MARYLAND AND VIRGINIA FOR VARIOUS YEARS
FROM 1891 TO 1915.

ATCH OF SHAD AND ALEWIVES IN CHESAPEAKE BAY AND HIS SEVERAL TRIBUTARIES FOR CERTAIN YEARS FROM 1896 TO 1915, BY WATERS.

REPORT OF THE COMMISSIONER OF FISHERIES.

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| | 16 | 206 | 5 | 442,500 | 1,327 | 705,000 | 1,565 |
|---------------------------------|-----------|-----------|---------|-----------|---------|-----------|---------|
| | 806 | 180 | 82 | 70 | 25 | 70 | 1,595 |
| Gunpowder River. | | | | | | | |
| Bush River. | | | | | | | |
| Susquehanna River: | | | | | | | |
| Maryland | 8,157 | 67,000 | 8,874 | 39,275 | 8,087 | 65,717 | 19,379 |
| Pennsylvania | 11,996 | 98,883 | 23,412 | 76,521 | 19,887 | 60,045 | 22,224 |
| Total. | 20,153 | 165,883 | 32,286 | 115,796 | 27,934 | 125,762 | 41,603 |
| Northeast River: | | | | | | | |
| Elk River. | 6,382 | (b) | 4,000 | 478 | (b) | 8,850 | 1,000 |
| Sassasassa River. | 5,214 | 637 | 2,500 | 298 | 1,392 | 8,150 | 3,215 |
| Chester River. | 1,290 | 7,918 | 4,475 | 739 | 4,215 | 1,010 | 5,718 |
| St. Michaels River. | 53,507 | 123 | | | | | |
| Eastern Bay. | 2,215 | | | | | | |
| Chesapeake Bay and tributaries: | | | | | | | |
| Lower Bay: | 33,839 | 35,810 | 142,297 | 20,918 | 40,287 | 8,237 | 108,936 |
| Piscataway Bay. | 9,730 | 1,174 | 1,555 | 296 | 715 | 118 | 1,426 |
| Blackwater River. | 13,160 | 1,480 | 6,000 | 905 | 10,930 | 1,801 | 800 |
| Transomshing River. | 13,694 | 1,287 | 2,125 | 290 | 2,088 | 497 | 2,800 |
| Nanticoke River: | | | 4,100 | 533 | 5,618 | 899 | 9,900 |
| Maryland | 125,181 | 11,618 | 34,985 | 5,977 | 31,028 | 7,308 | 21,945 |
| Delaware. | 52,467 | 5,155 | 37,097 | 6,315 | 22,450 | 5,321 | 7,700 |
| Total. | 177,648 | 16,803 | 72,082 | 12,292 | 53,478 | 12,629 | 29,645 |
| Marshyhope Creek. | 38,660 | 3,805 | (c) | (c) | (c) | (c) | (c) |
| Wicomico River. | 68,015 | 8,480 | 34,338 | 4,500 | 28,370 | 5,946 | 14,475 |
| Manokin River. | | | | | 16 | 5 | |
| Poconos: | | | | | | | |
| Virginia: | | | | | | | |
| Maryland | 29,732 | 4,304 | 2,137 | 414 | 1,550 | 330 | 5,600 |
| Pennsylvania | 28,575 | 4,004 | 13,986 | 3,179 | 24,130 | 8,445 | 9,734 |
| Total. | 29,732 | 4,304 | 30,712 | 4,418 | 15,545 | 3,559 | 29,730 |
| Potomac Sound: | | | | | | | |
| Virginia: | | | | | | | |
| Maryland | 21,237 | 2,422 | 800 | 155 | 1,030 | 153 | 49,776 |
| Pennsylvania | 1,416 | 163 | — | — | — | 56,272 | 17,530 |
| Total. | 22,673 | 2,535 | 800 | 155 | 1,090 | 153 | 105,018 |
| Potomac Sound: | | | | | | | |
| Virginia: | | | | | | | |
| Maryland | 8,320 | 917 | 901 | 2,900 | 560 | 5,340 | 814 |
| Pennsylvania | 5,149 | — | — | — | — | 2,500 | — |
| Total. | 15,469 | 1,748 | — | 2,900 | 500 | 5,360 | 814 |
| Grand total. | 4,867,619 | 4,026,165 | 516,339 | 2,952,042 | 624,152 | 2,924,018 | 789,739 |

a Includes all tributaries of Chesapeake Bay except the James, Potomac, and Pocono Rivers. b Included with Chesapeake Bay.

c Included with Nanticoke River.

NUMBER OF POUND NETS, THE CATCH OF SHAD AND ALEWIVES, AND THE AVERAGE CATCH OF EACH SPECIES PER NET FOR CERTAIN SECTIONS OF CHESAPEAKE BAY AND POTOMAC RIVER, 1915.

| Locality. | Number of pound nets. | Number of shad. | Number of alewives. | Average number of shad to net. | Average number of alewives to net. |
|--|-----------------------|-----------------|---------------------|--------------------------------|------------------------------------|
| From Cape Henry to Tue Point (lower side of York River mouth). | 496 | 268,374 | 1,974,490 | 541 | 3,980 |
| From York Spit (inclusive) to Stingray Point. | 623 | 491,196 | 4,437,345 | 772 | 7,122 |
| From Rappahannock Spit (inclusive) to Smith Point. | 276 | 291,266 | 21,667,166 | 1,054 | 78,504 |
| Potomac River. | 211 | 147,271 | 7,336,000 | 697 | 34,760 |

COASTAL FISHERIES OF NEW YORK AND NEW JERSEY.

Following a conference with the fishery authorities of the States of New York and New Jersey in January, 1916, regarding the condition of the coastal fisheries of those States and the measures necessary for their conservation, the Bureau undertook, by request, the canvass of those fisheries so that their actual extent might be known. The field work was completed in June and the results of the canvass were communicated to those interested. The figures related to the calendar year 1915 and covered only fishes proper.

In New York the number of persons engaged in the coastal fisheries was 2,504, and the investment in vessels, boats, fishing apparatus, and shore and accessory property was \$1,771,166. The products amounted to 34,017,775 pounds of fish, valued at \$1,121,611. Some of the more important species taken were bluefish, 6,107,113 pounds, valued at \$492,928; butterfish, 1,244,475 pounds, valued at \$51,636; cod, 1,259,160 pounds, valued at \$59,400; eels, 426,330 pounds, valued at \$34,387; flounders, 3,440,053 pounds, valued at \$96,337; mackerel, 342,489 pounds, valued at \$25,620; menhaden, 14,518,812 pounds, valued at \$100,935; scup, 1,026,736 pounds, valued at \$44,447; sea bass, 973,686 pounds, valued at \$44,894; and squeteague, 1,859,143 pounds, valued at \$98,324.

In New Jersey there were 2,303 persons employed in the coastal fisheries, and the investment amounted to \$1,192,057. The products aggregated 47,856,176 pounds of fish, valued at \$1,348,667. The species taken in largest quantities were bluefish, 2,728,779 pounds, valued at \$177,906; butterfish, 5,462,917 pounds, valued at \$51,677; cod, 679,133 pounds, valued at \$31,896; croaker, 2,084,719 pounds, valued at \$47,366; eels, 377,698 pounds, valued at \$28,257; flounders, 1,531,376 pounds, valued at \$58,443; mackerel, 367,307 pounds, valued at \$26,161; menhaden, 4,354,789 pounds, valued at \$36,602; scup, 3,279,693 pounds, valued at \$94,776; sea bass, 6,171,922 pounds, valued at \$203,163; squeteague, 14,121,330 pounds, valued at \$358,977; and whiting, 2,407,217 pounds, valued at \$36,367.

The statistics of these fisheries, by counties, are given in detail in the following table:

STATISTICS OF COASTAL FISHERIES OF NEW YORK AND NEW JERSEY, BY COUNTIES,
EXCLUSIVE OF SHELLFISH, 1915.

NEW YORK.

| Items. | Kings, New York, Queens, and Rich- mond Counties. | | Nassau County. | | Suffolk County. | | Total. | |
|--|---|-----------|----------------|---------|-----------------|-----------|------------|-------------|
| | Number. | Value. | Number. | Value. | Number. | Value. | Number. | Value. |
| Persons engaged. | 841 | | 119 | | 1,544 | | 2,504 | |
| Vessels fishing. | 57 | \$306,395 | 4 | \$5,850 | 84 | \$763,896 | 145 | \$1,076,141 |
| Tonnage. | 2,576 | | 32 | | 2,371 | | 4,979 | |
| Outfit. | 145,225 | | 620 | | 49,256 | | 195,101 | |
| Vessels trans- porting. | | | | | 21 | 52,720 | 21 | 52,720 |
| Tonnage. | | | | | 266 | | 266 | |
| Outfit. | | | | | | 2,240 | | 2,240 |
| Sail, row, and house boats. | 11 | 225 | 39 | 890 | 474 | 16,160 | 524 | 17,275 |
| Gasoline boats. | 4 | 2,850 | 34 | 14,750 | 282 | 112,025 | 320 | 129,625 |
| Pound nets. | 4 | 2,800 | | | 460 | 114,215 | 464 | 117,015 |
| Seines. | 20 | 17,900 | 23 | 1,173 | 117 | 37,010 | 160 | 56,083 |
| Gill nets. | 100 | 1,100 | 84 | 3,375 | 469 | 11,670 | 653 | 16,145 |
| Fyke nets. | | | | | 5,373 | 24,152 | 5,373 | 24,152 |
| Lines. | | 4,500 | | 635 | | 1,888 | | 6,973 |
| Otter trawls. | | | | | 156 | 3,815 | 156 | 3,815 |
| Eelpots. | 250 | 275 | 390 | 430 | 5,055 | 5,503 | 5,695 | 6,208 |
| Other apparatus. | | | | 2,276 | | 112 | | 2,388 |
| Shore and acces- sory property. | | 650 | | 1,050 | | 63,585 | | 65,285 |
| Total. | | 481,920 | | 31,049 | | 1,258,197 | | 1,771,166 |
| Products: | | | | | | | | |
| Albacore and h o r s e mackerel. | 430 | \$25 | | | 4,450 | \$129 | 4,880 | \$154 |
| Alewives. | 11,000 | 140 | 500 | \$10 | 523,605 | 7,214 | 535,105 | 7,364 |
| Bluefish. | 5,790,205 | 466,522 | 27,200 | 2,690 | 289,708 | 23,716 | 6,107,113 | 492,928 |
| Bonito. | 1,054 | 100 | 300 | 30 | 11,795 | 1,157 | 13,149 | 1,287 |
| Butterfish. | 60,000 | 1,800 | | | 1,184,475 | 49,836 | 1,244,475 | 51,636 |
| Carp. | | | | | 102,300 | 7,592 | 102,300 | 7,592 |
| Cod. | 723,375 | 32,855 | 201,000 | 9,550 | 334,785 | 16,995 | 1,259,160 | 59,400 |
| Croaker. | 14,949 | 336 | | | 10,000 | 350 | 24,949 | 686 |
| Eel. | 5,630 | 532 | 32,900 | 3,395 | 387,800 | 30,460 | 426,330 | 34,387 |
| Flounders. | 28,123 | 838 | 115,000 | 3,240 | 3,296,930 | 92,259 | 3,440,053 | 96,337 |
| Haddock. | 34,041 | 1,238 | 2,000 | 100 | 49,550 | 2,573 | 85,591 | 3,911 |
| Hake. | 2,044 | 63 | 8,500 | 200 | 52,725 | 1,238 | 63,269 | 1,501 |
| Hog choker. | | | | | 7,200 | 60 | 7,200 | 60 |
| Kingfish. | 89 | 18 | | | 31,005 | 3,170 | 31,094 | 3,188 |
| Mackerel. | 9,360 | 968 | 6,800 | 630 | 326,329 | 24,022 | 342,489 | 25,620 |
| Menhaden. | 2,632,100 | 19,307 | 6,000 | 60 | 11,880,712 | 81,568 | 14,518,812 | 100,935 |
| Mullet, fresh. | | | | | 5,113 | 203 | 5,113 | 203 |
| Mummichog. | | | 8,000 | 40 | 138,250 | 1,023 | 146,250 | 1,063 |
| Pike. | | | | | 800 | 96 | 800 | 96 |
| Pollock. | 16,170 | 529 | 30,000 | 900 | 35,540 | 1,465 | 81,710 | 2,894 |
| Scup, or porgy. | 511,476 | 20,574 | | | 515,260 | 23,873 | 1,026,736 | 44,447 |
| Sea bass. | 270,263 | 14,398 | 150,000 | 2,500 | 553,423 | 27,996 | 973,686 | 44,894 |
| Sea robins. | 2,657 | 29 | | | 97,905 | 1,251 | 100,562 | 1,280 |
| Shad. | 5,250 | 785 | | | 14,705 | 1,365 | 19,955 | 2,150 |
| Sharks. | 20,975 | 84 | | | 19,225 | 192 | 40,200 | 276 |
| Skates. | 7,700 | 77 | | | 204,463 | 1,360 | 212,163 | 1,437 |
| Smelt. | | | 2,300 | 350 | 4,450 | 1,320 | 6,750 | 1,670 |
| Spanishmack- erel. | 529 | 162 | 50 | 10 | 20 | 2 | 599 | 174 |
| Spot. | | | | | 1,500 | 60 | 1,500 | 60 |
| Squeateague. | 592,254 | 22,477 | 56,950 | 3,022 | 1,209,939 | 72,825 | 1,859,143 | 98,324 |
| Squid. | 1,200 | 12 | | | 556,425 | 8,306 | 557,625 | 8,318 |
| Striped bass. | | | 2,200 | 344 | 14,700 | 2,460 | 16,900 | 2,804 |
| Sturgeon. | | | | | 3,826 | 673 | 3,826 | 673 |
| S t u r g e o n | | | | | | | | |
| caviar. | | | | | 241 | 248 | 241 | 248 |
| Swellfish. | | | | | 50,225 | 370 | 50,225 | 370 |
| Swordfish. | | | | | 7,362 | 756 | 7,362 | 756 |
| Tautog. | 881 | 38 | 100 | 5 | 98,100 | 3,989 | 99,081 | 4,032 |
| Tilefish. | a 183,484 | 7,748 | | | | | 183,484 | 7,748 |
| Tomcod. | | | | | 70,157 | 2,716 | 70,157 | 2,716 |
| White bait. | | | | | 28,200 | 2,220 | 28,200 | 2,220 |
| White perch. | | | | | 19,400 | 2,038 | 19,400 | 2,038 |
| Whiting. | 1,000 | 10 | | | 328,925 | 3,742 | 329,925 | 3,752 |
| Other fish. | | | | | 213 | 12 | 213 | 12 |
| Total. | 10,926,239 | 591,665 | 649,800 | 27,076 | 22,471,736 | 502,900 | 34,047,775 | 1,121,641 |

^a Landed by New York vessels and does not include tilefish landed at New York by vessels from other ports.

STATISTICS OF COASTAL FISHERIES OF NEW YORK AND NEW JERSEY, BY COUNTIES,
EXCLUSIVE OF SHELLFISH, 1915—Continued.

NEW JERSEY.

| Items. | Atlantic County. | | Bergen and Hudson Counties, ^a | | Cape May County. | | Middlesex County. | |
|-----------------------------------|------------------|----------|--|--------|------------------|----------|-------------------|--------|
| | Number. | Value. | Number. | Value. | Number. | Value. | Number. | Value. |
| Persons engaged..... | 298 | | 43 | | 680 | | 54 | |
| Vessels fishing..... | 19 | \$71,485 | | | 25 | \$74,690 | | |
| Tonnage..... | 349 | | | | 330 | | | |
| Outfit..... | | 25,130 | | | | 32,725 | | |
| Vessels transporting..... | 2 | 3,500 | | | 1 | 50 | | |
| Tonnage..... | 15 | | | | 10 | | | |
| Outfit..... | | 45 | | | | | | |
| Sail, row, and house boats..... | 63 | 1,720 | 16 | \$742 | 38 | 480 | 21 | \$900 |
| Gasoline boats..... | 34 | 12,250 | 4 | 900 | 130 | 69,600 | 8 | 2,400 |
| Pound nets..... | 3 | 1,950 | | | 58 | 128,325 | 1 | 600 |
| Seines..... | 42 | 1,722 | 5 | 215 | 21 | 3,988 | 10 | 4,175 |
| Gill nets..... | 45 | 1,785 | 10 | 1,315 | 192 | 15,912 | | |
| Fyke nets..... | 11 | 460 | 26 | 400 | 48 | 2,050 | 4 | 200 |
| Bag nets..... | 15 | 375 | | | | | | |
| Lines..... | | 624 | | 10 | | 3,186 | | |
| Eelpots..... | 50 | 45 | 4 | 6 | 202 | 325 | 98 | 98 |
| Other apparatus..... | | | | 75 | | | | |
| Shore and accessory property..... | | 2,420 | | 1,436 | | 38,840 | | 550 |
| Total..... | | 123,511 | | 5,099 | | 370,171 | | 8,923 |
| Products: | | | | | | | | |
| Albacore and horse mackerel..... | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. |
| Alewives..... | 800 | \$11 | 329 | | 10,220 | \$172 | | |
| Bluefish..... | 13,862 | 329 | 300 | \$30 | 29,500 | 474 | 7,500 | \$100 |
| Bonito..... | 163,664 | 12,004 | | | 874,335 | 55,620 | 18,900 | 915 |
| Butterfish..... | 800 | 48 | | | 17,469 | 857 | | |
| Carp..... | 49,205 | 1,041 | | | 2,166,453 | 61,712 | | |
| Cod..... | 201,000 | 9,530 | 10,650 | 1,137 | | | 12,500 | 1,100 |
| Croaker..... | 297,278 | 6,488 | | | 1,063,735 | 24,515 | | |
| Drum..... | 480 | 5 | | | 5,550 | 63 | | |
| Eel..... | 5,875 | 419 | 8,025 | 670 | 42,885 | 4,669 | 1,800 | 127 |
| Flounders..... | 68,744 | 2,728 | | | 318,044 | 11,748 | 4,400 | 197 |
| Haddock..... | | | | | | 200 | | |
| Hake..... | 200 | 3 | | | 1,249 | 37 | | |
| Kingfish..... | 24,065 | 2,150 | | | 17,429 | 1,925 | | |
| Mackerel..... | 152,125 | 10,860 | | | 148,232 | 10,509 | | |
| Menahaden..... | 1,200,000 | 14,000 | | | 101,381 | 598 | 112,569 | 236 |
| Mullet, fresh..... | 5,500 | 103 | | | 34,750 | 990 | | |
| Mullet, salted..... | | | | | 500 | 50 | | |
| Pollock..... | | | | | | 325 | | 4 |
| Scup, or porgy..... | 840,400 | 25,109 | | | 1,887,117 | 53,090 | | |
| Sea bass..... | 1,522,238 | 49,280 | | | 3,943,624 | 123,796 | | |
| Shad..... | 115 | 19 | 20,104 | 2,674 | 170 | 20 | 1,705 | 312 |
| Sharks..... | | | | | 10,198 | 143 | | |
| Skates..... | 1,200 | 11 | | | 89,180 | 911 | | |
| Smelt..... | | | | | | | 6,000 | 1,200 |
| Spanish mackerel..... | | | | | 270 | 39 | | |
| Spot..... | 4,175 | 132 | | | 13,085 | 304 | 2,000 | 60 |
| Squeteague..... | 1,634,099 | 42,613 | | | 4,331,759 | 122,331 | 88,200 | 3,013 |
| Squid..... | 500 | 6 | | | 289,826 | 3,617 | | |
| Striped bass..... | 7,030 | 1,384 | | | | | 200 | 25 |
| Sturgeon..... | | | | | 65 | 4 | | |
| Suckers..... | 3,550 | 226 | 15,000 | 1,645 | | | | |
| Tautog..... | 600 | 12 | | | 760 | 19 | | |
| White perch..... | 27,159 | 2,373 | | | 1,575 | 145 | 75 | 6 |
| Whiting..... | | | | | 2,000 | 33 | | |
| Yellow perch..... | 165 | 15 | | | 450 | 22 | | |
| Other fish..... | 1,200 | \$3 | 5,035 | 495 | 180 | 19 | | |
| Total..... | 6,226,082 | 180,782 | 59,114 | 6,671 | 15,664,386 | 491,288 | 255,849 | 7,291 |

^a Includes men, boats, apparatus, and shore property employed and catch of fish taken in Upper New York Bay and Hackensack River, and also men, boats, apparatus, and shore property employed and catch of shad taken in Hudson River.

STATISTICS OF COASTAL FISHERIES OF NEW YORK AND NEW JERSEY, BY COUNTIES,
EXCLUSIVE OF SHELLFISH, 1915—Continued.

NEW JERSEY—Continued

| Items. | Monmouth County. | | Ocean and Burling-ton Counties. | | Total. | |
|-----------------------------------|------------------|---------|---------------------------------|---------|------------|-----------|
| | Number. | Value. | Number. | Value. | Number. | Value. |
| Persons engaged..... | 582 | | 646 | | 2,303 | |
| Vessels fishing..... | 3 | \$7,300 | 1 | \$1,500 | 48 | \$154,975 |
| Tonnage..... | 38 | | 6 | | 723 | |
| Outfit..... | | 3,900 | | 80 | | |
| Vessels transporting..... | 2 | 11,000 | | | 5 | 61,835 |
| Tonnage..... | 21 | | | | 46 | 14,550 |
| Outfit..... | | 1,450 | | | | 1,495 |
| Sail, row, and house boats..... | 67 | 1,655 | 206 | 10,436 | 411 | 15,933 |
| Gasoline boats..... | 179 | 78,150 | 154 | 55,100 | 509 | 218,400 |
| Found nets..... | 65 | 83,090 | 47 | 127,800 | 174 | 341,765 |
| Seines..... | 8 | 2,440 | 46 | 2,410 | 132 | 14,950 |
| Gill nets..... | 155 | 8,050 | 1,359 | 10,626 | 1,761 | 37,688 |
| Fyke nets..... | 103 | 1,430 | 778 | 5,660 | 970 | 10,200 |
| Bag nets..... | | | 75 | 1,900 | 90 | 2,275 |
| Lines..... | | 2,327 | | 725 | | 6,872 |
| Otter trawls..... | | | 1 | 20 | 1 | 20 |
| Eelpots..... | 1,424 | 1,822 | 3,461 | 2,685 | 5,239 | 4,981 |
| Other apparatus..... | | 7 | | 30 | | 112 |
| Shore and accessory property..... | | 118,725 | | 144,035 | | 306,006 |
| Total..... | | 321,346 | | 363,007 | | 1,192,057 |
| Products: | | | | | | |
| Albacore and horse mackerel..... | 14,255 | \$654 | 44,987 | \$1,095 | 70,262 | \$1,932 |
| Alewives..... | 214,270 | 2,153 | 351,865 | 3,779 | 617,297 | 6,865 |
| Bluefish..... | 1,402,898 | 87,697 | 268,982 | 21,670 | 2,728,779 | 177,906 |
| Bonito..... | 23,175 | 1,908 | 75,878 | 6,291 | 117,322 | 9,104 |
| Butterfish..... | 711,881 | 22,297 | 2,535,378 | 66,627 | 5,462,917 | 151,677 |
| Carp..... | | | | | 23,150 | 2,257 |
| Cod..... | 122,908 | 5,697 | 93,355 | 4,027 | 679,133 | 31,896 |
| Croaker..... | 288,080 | 7,178 | 435,626 | 9,185 | 2,084,719 | 47,366 |
| Drum..... | 8,600 | 86 | | | 14,630 | 154 |
| Eel..... | 131,238 | 9,161 | 187,875 | 13,211 | 377,698 | 28,257 |
| Flounders..... | 373,415 | 15,297 | 766,773 | 28,473 | 1,531,376 | 58,443 |
| Goosefish..... | 40,000 | 125 | | | 40,000 | 125 |
| Haddock..... | | | | | 200 | 10 |
| Hake..... | 727,493 | 9,305 | 439,683 | 4,638 | 1,168,625 | 13,983 |
| Hickory shad..... | 3,500 | 165 | | | 3,500 | 165 |
| Kingfish..... | 5,910 | 904 | 13,190 | 2,188 | 60,597 | 7,167 |
| Mackerel..... | 50,175 | 3,490 | 16,775 | 1,302 | 367,307 | 26,161 |
| Menhaden..... | 2,765,830 | 20,142 | 175,009 | 1,626 | 4,354,789 | 36,602 |
| Mullet, fresh..... | 22,750 | 910 | | | 63,000 | 2,003 |
| Mullet, salted..... | | | | | 500 | 50 |
| Pollock..... | 3,500 | 111 | 8,999 | 267 | 12,824 | 382 |
| Round herring..... | 35,432 | 717 | | | 35,432 | 717 |
| Scup, or porgy..... | 164,950 | 5,992 | 387,226 | 10,585 | 3,279,693 | 94,776 |
| Sea bass..... | 327,800 | 16,339 | 378,260 | 13,748 | 6,171,922 | 203,163 |
| Sea robins..... | 35,500 | 425 | 41,375 | 620 | 76,875 | 1,045 |
| Shad..... | 12,813 | 2,183 | 7,230 | 1,060 | 42,137 | 6,268 |
| Sharks..... | 84,550 | 748 | 17,800 | 175 | 112,548 | 1,066 |
| Skates..... | 272,470 | 1,600 | 150,716 | 857 | 513,566 | 3,379 |
| Smelt..... | | | | | 6,000 | 1,200 |
| Spanish mackerel..... | 164 | 34 | 621 | 109 | 1,055 | 182 |
| Spot..... | 18,950 | 431 | 28,450 | 740 | 66,660 | 1,667 |
| Squeteague..... | 3,055,048 | 86,973 | 5,012,224 | 104,047 | 14,121,330 | 358,977 |
| Squid..... | 157,370 | 2,125 | 525,975 | 7,082 | 973,671 | 12,830 |
| Striped bass..... | 220 | 44 | 7,148 | 1,770 | 14,648 | 3,223 |
| Sturgeon..... | 2,788 | 435 | 500 | 50 | 3,353 | 489 |
| Sturgeon caviar..... | 270 | 272 | | | 270 | 272 |
| Suckers..... | | | 8,700 | 586 | 27,250 | 2,457 |
| Tautog..... | 40,650 | 1,772 | 3,000 | 105 | 45,010 | 1,908 |
| Tilefish..... | 30 | 3 | | | 30 | 3 |
| Toadfish..... | 5,800 | 80 | | | 5,800 | 80 |
| White bait..... | 750 | 33 | | | 750 | 33 |
| White perch..... | | | 136,130 | 12,881 | 164,939 | 15,405 |
| Whiting..... | 1,754,995 | 26,636 | 650,222 | 9,698 | 2,407,217 | 36,367 |
| Yellow perch..... | | | 365 | 21 | 6,780 | 618 |
| Other fish..... | | | | | | |
| Total..... | 12,880,428 | 334,122 | 12,770,317 | 328,513 | 47,856,176 | 1,348,667 |

SHAD FISHERY OF THE HUDSON RIVER.

In connection with the canvass of the coastal fisheries of New York and New Jersey the shad fishery of the Hudson River was covered for the years 1915 and 1916. The statistics are given in the following table, showing for the latter year 119 fishermen, 79 gill nets, 3 seines, and a catch of 9,287 shad, valued at \$5,465. The Hudson was at one time one of the great shad streams, its annual output running into the hundreds of thousands. Thus, in 1896 the number of shad taken was 588,898, valued at \$83,237. The present condition of the shad fishery is most deplorable.

SHAD FISHERY OF THE HUDSON RIVER, 1915 AND 1916.^a

1915.

| Items. | New York. | | | New Jersey. | | | Total. | | |
|--|-----------|--------|---------|-------------|--------|--------|--------|--------|---------|
| | No. | Lbs. | Value. | No. | Lbs. | Value. | No. | Lbs. | Value. |
| Fishermen..... | 133 | | | 27 | | | 160 | | |
| Sail and row boats..... | 81 | | \$2,975 | 7 | | \$430 | 88 | | \$3,405 |
| Gasoline boats..... | 2 | | 225 | 2 | | 600 | 4 | | 825 |
| Gill nets..... | 79 | | 3,984 | 7 | | 1,035 | 86 | | 5,019 |
| Seines..... | 2 | | 190 | | | | 2 | | 190 |
| Shore and accessory property..... | | 528 | | | | 1,230 | | | 1,758 |
| Total..... | | | 7,902 | | | 3,295 | | | 11,197 |
| Shad caught: | | | | | | | | | |
| With gill nets..... | 11,333 | 47,333 | 5,834 | 4,249 | 20,104 | 2,674 | 15,582 | 67,437 | 8,508 |
| With seines..... | 62 | 298 | 33 | | | | 62 | 298 | 33 |
| With other apparatus incidentally..... | 211 | 933 | 102 | | | | 211 | 933 | 102 |
| Total..... | 11,606 | 48,564 | 5,969 | 4,249 | 20,104 | 2,674 | 15,855 | 68,668 | 8,643 |

1916.

| | | | | | | | | | |
|--|-------|--------|---------|-------|-------|-------|-------|--------|---------|
| Fishermen..... | 108 | | | 11 | | | 119 | | |
| Sail and row boats..... | 64 | | \$2,240 | 3 | | \$195 | 67 | | \$2,435 |
| Gasoline boats..... | 2 | | 225 | 1 | | 350 | 3 | | 575 |
| Gill nets..... | 76 | | 2,937 | 3 | | 480 | 79 | | 3,417 |
| Seines..... | 3 | | 350 | | | | 3 | | 350 |
| Shore and accessory property..... | | 528 | | | | 540 | | | 1,068 |
| Total..... | | | 6,280 | | | 1,565 | | | 7,845 |
| Shad caught: | | | | | | | | | |
| With gill nets..... | 7,536 | 31,670 | 4,399 | 1,500 | 7,250 | 925 | 9,036 | 38,920 | 5,324 |
| With seines..... | 191 | 1,008 | 99 | | | | 191 | 1,008 | 99 |
| With other apparatus incidentally..... | 60 | 245 | 42 | | | | 60 | 245 | 42 |
| Total..... | 7,787 | 32,923 | 4,540 | 1,500 | 7,250 | 925 | 9,287 | 40,173 | 5,465 |

^a Includes Albany, Columbia, Dutchess, Green, Orange, Rensselaer, Rockland, Schuyler, Ulster, and Westchester Counties in New York, and Bergen and Hudson Counties in New Jersey.

NEW ENGLAND VESSEL FISHERIES.

Statistics of the extensive offshore vessel fisheries centering at Boston and Gloucester, Mass., have been collected during the year by the local agents, and published in monthly and annual bulletins showing, by species and fishing grounds, the quantities and values of the fishery products landed by the American fishing vessels at these ports.

The fleet in 1915 was composed of 410 sail, steam, and gasoline screw vessels. These vessels landed at Boston 3,772 trips, aggregating

97,899,487 pounds of fish, valued at \$2,911,314, and at Gloucester 3,472 trips, aggregating 73,696,241 pounds, valued at \$1,826,603. The total for the two ports was 7,244 trips, aggregating 171,595,728 pounds of fresh and salted fish, having a value to the fishermen of \$4,737,917. Compared with the previous year there was a decrease of 354 trips, but an increased production amounting to 9,006,508 pounds in quantity and \$342,887 in value. There was a small decrease in the catch of cod, but an increase in that of practically all the other important species. The value of haddock and cusk was slightly less than that of the previous year. The halibut product increased 491,100 pounds in quantity and \$46,946 in value. The mackerel catch increased 6,688,850 pounds, or over 63 per cent, in quantity, and \$259,354, or 73 per cent, in value. There was some decrease in the take of Newfoundland herring, but an increase in the value. Swordfish increased 739,123 pounds in quantity and \$43,890 in value.

The following tables present in detail (1) by fishing grounds and (2) by months the products of the vessel fisheries of Boston and Gloucester during the calendar year 1915. The weights of fresh and salted fish given in these statistics represent the fish as landed from the vessels, and the values are those received by the fishermen. The grades, or sizes, given for certain species are those recognized in the trade.

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., BY AMERICAN FISHING VESSELS
DURING THE CALENDAR YEAR 1915, SHOWN BY FISHING GROUNDS.

| Fishing grounds. | Number of trips. | Landed at Boston. | | Market (under 10 and over 2½ pounds). | | | | Cod. | | | |
|------------------------------------|------------------|-------------------|-----------------------------|---------------------------------------|-----------|---------|---------|---------|---------|--------|---------|
| | | Fresh. | Large (10 pounds and over). | Fresh. | Salted. | Fresh. | Salted. | Fresh. | Salted. | Fresh. | Salted. |
| <i>LANDED AT BOSTON.</i> | | | | | | | | | | | |
| <i>East of 66° west longitude.</i> | | | | | | | | | | | |
| La Flave Bank..... | 25 | 141,030 | \$5,338 | 1,046 | 155,543 | \$3,288 | 1,370 | 20,000 | \$201 | 227 | ... |
| Off St. John Bank..... | 35 | 172,339 | 5,016 | 2,751 | 291,735 | 3,790 | ... | 20,100 | 227 | ... | ... |
| Off Far Bank..... | 2 | 15,000 | 400 | ... | ... | ... | ... | ... | ... | ... | ... |
| Green Bank..... | 1 | 4,282 | 363 | ... | ... | ... | ... | ... | ... | ... | ... |
| Grund Bank..... | 1 | 3,300 | 184 | ... | ... | ... | ... | ... | ... | ... | ... |
| St. Peter's Bank..... | 4 | 1,300 | 36 | ... | ... | ... | ... | ... | ... | ... | ... |
| Off Newfoundland..... | 167 | 415,194 | 14,881 | 14,121 | 554,092 | 11,212 | 80 | 85,393 | 871 | ... | ... |
| Cape North..... | 15 | 3,065 | 121 | ... | ... | ... | ... | ... | ... | ... | ... |
| Cape Shore..... | 2 | 3,380 | 102 | ... | ... | ... | ... | ... | ... | ... | ... |
| Gulf of St. Lawrence..... | 1 | 11,100 | 461 | ... | ... | ... | ... | ... | ... | ... | ... |
| St. Ann's Bank..... | 1 | 1,000 | 25 | ... | ... | ... | ... | ... | ... | ... | ... |
| The Gully..... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Roseway Bank..... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| <i>West of 66° west longitude.</i> | | | | | | | | | | | |
| Browns Bank..... | 282 | 1,343,950 | 50,449 | 50,449 | 2,235,641 | 45,333 | ... | 216,774 | 2,799 | 695 | 814 |
| Georges Bank..... | 507 | 1,519,392 | 66,574 | 66,574 | 2,753,489 | 64,879 | ... | 142,671 | 2,147 | ... | ... |
| Cashes Bank..... | 33 | 94,870 | 3,311 | 3,311 | 81,660 | 2,083 | ... | 8,627 | 111 | ... | ... |
| Clark Bank..... | 5 | 22,295 | 1,088 | 1,088 | 60,202 | 1,368 | ... | 2,325 | 21 | ... | ... |
| Fippines Bank..... | 10 | 14,170 | 755 | 755 | 25,355 | 626 | ... | 1,335 | 23 | ... | ... |
| Tilles Bank..... | 1 | 5,570 | 438 | 438 | 1,073 | 43 | ... | 540 | 8 | ... | ... |
| Middle Bank..... | 222 | 159,055 | 8,531 | 8,531 | 208,112 | 5,066 | ... | 28,086 | 423 | ... | ... |
| Jeffries Ledge..... | 541 | 345,375 | 16,895 | 16,895 | 457,004 | 13,147 | ... | 42,222 | 712 | ... | ... |
| Fuswick Bay..... | 50 | 145,566 | 5,913 | 5,913 | 69,250 | 1,597 | ... | 3,667 | 61 | ... | ... |
| South Channel..... | 316 | 663,110 | 40,226 | 40,226 | 1,883,970 | 53,989 | ... | 241,555 | 3,530 | ... | ... |
| Northfield Shoals..... | 62 | 114,508 | 5,843 | 5,843 | 367,113 | 13,558 | ... | 47,352 | 576 | ... | ... |
| Off Highland Light..... | 9 | 1,365,015 | 66,469 | 66,469 | 6,173 | 235 | ... | 226,835 | 112 | ... | ... |
| Off Chatham..... | 61 | 7,730 | 216 | 216 | 2,201,528 | 53,368 | ... | 226,530 | 2,758 | ... | ... |
| Off Luce Point..... | 5 | 6,830 | 125 | 125 | ... | ... | ... | 340 | 4 | ... | ... |
| Bay of Fundy..... | 1 | 7,045 | 93 | 93 | ... | ... | ... | 275 | 2 | ... | ... |

LANDED AT GLOUCESTER.

East of 66° west longitude.

| | | | | | | | | | | |
|-----------------------------|------------|-----------|---------|-------|------------|---------|-----------|---------|-----------|---------|
| La Have Bank..... | 230,660 | 2,408 | 11,035 | \$193 | 27,120 | 184 | 964,811 | 11,530 | 28,680 | 453 |
| Western Bank..... | 987,020 | 10,189 | 9,695 | 183 | 52 | 184 | 1,165,560 | 14,164 | 45,798 | 800 |
| Quereau Bank..... | 108,310 | 1,091 | 2,960 | 52 | ..... | ..... | 110,230 | 1,297 | 23,633 | 398 |
| Green Bank..... | ..... | ..... | ..... | ..... | ..... | ..... | 14,615 | 183 | 3,385 | 600 |
| Grand Bank..... | ..... | ..... | ..... | ..... | ..... | ..... | 33,975 | 415 | 81,640 | 1,282 |
| St. Peters Bank..... | ..... | ..... | ..... | ..... | ..... | ..... | 171,880 | 5 | 5,200 | 91 |
| Sambro Bank..... | 6,780 | 71 | ..... | ..... | ..... | 1,675 | 2,149 | 17 | ..... | ..... |
| Burgeo Bank..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,135 | 11 | 975 | 17 |
| Bacalieu Bank..... | 100 | 1 | 50 | 1 | ..... | ..... | 341,890 | 4,226 | 29,270 | 512 |
| Off Newfoundland..... | 115,250 | 2,780 | 5,584 | 98 | 520 | 3 | 84,905 | 25,266 | 474 | ..... |
| Cape North..... | 8,785 | 91 | 17,390 | 352 | 1,115 | 20 | 10,730 | 134 | 3,375 | 59 |
| Cape Shore..... | 12,760 | 140 | 30 | 1 | ..... | ..... | 78,240 | 1,213 | 7,105 | 120 |
| St. Ann's Bank..... | 5,230 | 53 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| The Gully..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| West of 66° west longitude. | | | | | | | | | | |
| Browns Bank..... | 1,410,412 | 17,601 | 5,215 | 91 | 12,540 | 122 | 506,533 | 5,849 | 11,915 | 207 |
| Georges Bank..... | 4,835,132 | 50,380 | 61,326 | 1,100 | 77,965 | 5,093 | 69,442 | 838 | 2,646 | 43 |
| Cashes Bank..... | 12,070 | 126 | ..... | ..... | ..... | ..... | 244,600 | 2,467 | ..... | ..... |
| Flippens Bank..... | ..... | ..... | ..... | ..... | ..... | ..... | 13,675 | 137 | ..... | ..... |
| Jeffreys Ledge..... | 1,075 | 11 | ..... | ..... | ..... | ..... | 78,435 | 784 | ..... | ..... |
| Ipswich Bay..... | 1,725 | 17 | 4,128 | 40 | 255,025 | 1,639 | 5,883 | 59 | ..... | ..... |
| South Channel..... | 400,245 | 740 | 8 | 2,300 | 40 | ..... | 29,990 | 367 | ..... | ..... |
| Nantucket Shoals..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Bay of Fundy..... | 776,216 | 28,242 | 234 | 4 | 5,690 | 67 | 46,900 | 469 | 10,152 | 178 |
| Shore, general..... | 8,913,010 | 117,437 | 130,594 | 2,361 | 1,060,575 | 7,728 | 951,171 | 17,075 | 64,326 | 4,932 |
| Total..... | 44,948,106 | 1,131,660 | 130,594 | 2,361 | 12,864,944 | 173,792 | 7,769,018 | 157,516 | 300,625 | 5,007 |
| Grand total..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 6,820,297 | 119,954 |

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., BY AMERICAN FISHING VESSELS
DURING THE CALENDAR YEAR 1915, SHOWN BY FISHING GROUNDS—Continued.

LANDED AT GLOUCESTER.

East of 66° West longitude.

Grand total...

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., BY AMERICAN FISHING VESSELS
DURING THE CALENDAR YEAR 1915, SHOWN BY FISHING GROUNDS—Continued.

REPORT OF THE COMMISSIONER OF FISHERIES.

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| Fishing grounds. | Miscellaneous. | | | Total. | | | Grand total. |
|------------------------------------|------------------|-----------------|------------------|-------------------|--------------------|-------------------|--------------------|
| | Fresh. | Salted. | Fresh. | Salted. | Fresh. | Salted. | |
| LANDED AT BOSTON, | | | | | | | |
| <i>East of 66° west longitude.</i> | | | | | | | |
| La Have Bank..... | Pounds. 6,736 | Value. \$464 | Pounds. 8,991 | Value. \$2,881 | Pounds. 943,339 | Value. \$2,358 | Pounds. 944,359 |
| Western Bank..... | 82,882 | | | | 2,881,105 | 61,605 | |
| Quereau Bank..... | | | | | 23,338 | 23,338 | 977 |
| Green Bank..... | | | | | 50,000 | 50,000 | 3,500 |
| Grand Bank..... | | | | | 69,635 | 69,635 | 4,454 |
| St. Peters Bank..... | 360 | 31 | | | 4,454 | | |
| Off Newfoundland..... | 508 | 37 | | | 35,608 | 2,071 | |
| Cape Shore..... | 600,000 | 15,900 | | | 635,000 | 20,300 | |
| Cape of St. Lawrence..... | 871,924 | 67,023 | | | 49,100 | 3,255 | |
| St. Ann's Bank..... | | | | | 214,615 | 167,043 | |
| The Gully..... | | | | | 251,200 | 13,259 | |
| Roseway Bank..... | | | | | 35,737 | | |
| Browns Bank..... | 188,492 | 8,670 | | | 26,735 | | |
| Georges Bank..... | 1,475,034 | 142,224 | | | 905 | | |
| Cashes Bank..... | 34,558 | 1,814 | | | 91 | | |
| Clark Bank..... | 9,399 | 235 | | | | | |
| Filipenes Bank..... | 6,325 | 118 | | | | | |
| Middle Bank..... | 650 | 21 | | | | | |
| Jeffreys Ledge..... | 80,375 | 1,797 | | | | | |
| Ipswich Bay..... | 222,079 | 5,632 | | | | | |
| South Channel..... | 1,028,825 | 1,698 | | | | | |
| Nantucket Shoals..... | 34,132 | 37 | | | | | |
| Off Highland Light..... | 56,361 | 1,708 | | | | | |
| Off Chatham..... | 5,483 | 99 | | | | | |
| Off Race Point..... | 465,617 | 9,310 | | | | | |
| Bay of Fundy..... | 11,949 | 228 | | | | | |
| Seal Island..... | 9,300 | 291 | | | | | |
| South..... | 28,483 | 16 | | | | | |
| Shore, general..... | 627,096 | 1,101 | | | | | |
| Total..... | 5,809,344 | 314,113 | | | | | |
| | | | | | 97,397,285 | 2,888,354 | 502,202 |
| | | | | | | | 22,960 |
| | | | | | | | 97,889,457 |
| | | | | | | | 2,911,314 |

a Herring.

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., BY AMERICAN FISHING VESSELS
DURING THE CALENDAR YEAR 1915, SHOWN BY FISHING GROUNDS—Continued.

| Fishing grounds. | | Total. | | Grand total. | |
|-----------------------------|------------|-----------|------------|--------------|-------------|
| LANDED AT GLOUCESTER. | | Fresh. | | Salted. | |
| East of 69° west longitude. | | Pounds. | | Value. | |
| La Have Bank. | 2,131,261 | \$22,791 | | 145,970 | \$3,930 |
| Western Bank. | 5,047,891 | 85,717 | 322,309 | 9,935 | 2,277,231 |
| Quebec Bank. | 1,826,634 | 562 | 520 | 5,370,200 | 95,652 |
| Green Bank. | 1,444,450 | 7,034 | 24,889 | 3,324,256 | 119,927 |
| Grand Bank. | 1,671,348 | 60,307 | 1,543,719 | 52,318 | 2,169,359 |
| St. Peters Bank. | 7,015 | 568 | 21,120 | 688 | 2,165,067 |
| Sambro Bank. | 268,020 | 3,527 | 690 | 28,135 | 112,625 |
| Bureau Bank. | 130,572 | 6,184 | 21,287 | 893 | 268,710 |
| Bacchus Bank. | 75,730 | 2,036 | 2,639 | 151,859 | 3,546 |
| Off Newfoundland. | 1,770,150 | 53,075 | 8,931,550 | \$1,861,933 | 7,077 |
| Cape North. | 1,861,933 | 56,734 | 10,385,261 | 238,674 | 2,639 |
| Cape Shore. | 2,500 | 164 | 210 | 2,174 | 295,408 |
| Gulf of St. Lawrence. | 1,881,269 | 27,829 | 78,045 | 28,744 | 2,338 |
| St. Ann's Bank. | 4,132,169 | 85,022 | 4,014,255 | 144,650 | 8,146,434 |
| The Gulf. | 364,396 | 9,132 | 1,708 | 10,780 | 229,672 |
| Faborior Coast. | 368,440 | 28,087 | 82,665 | 3,128 | 10,860 |
| | | | 120,126 | 9,290 | 31,215 |
| | | | | 120,126 | 9,290 |
| | | | | | 9,290 |
| West of 69° west longitude. | | Pounds. | | Value. | |
| Browns Bank. | 4,436,612 | 67,425 | 93,166 | 2,829 | 4,529,778 |
| Georges Bank. | 7,990,495 | 108,040 | 2,336,766 | 87,145 | 70,254 |
| Cashes Bank. | 473,355 | 5,766 | 5,766 | ... | 10,227,461 |
| Fiducies Bank. | 20,955 | 253 | 253 | ... | 473,353 |
| Middle Bank. | 663,036 | 1,002,700 | 83,011 | 5,965 | 5,253 |
| Jeunes Ledge. | 191,600 | 2,613 | 2,613 | 1,667,736 | 13,560 |
| Ipswich Bay. | 141,890 | 2,420 | 2,420 | 191,600 | 2,613 |
| South Channel. | 796,700 | 8,338 | 8,338 | 796,700 | 2,420 |
| Nantucket Shoals. | 162,151 | 2,980 | 199,545 | 9,862 | 8,338 |
| Off Race Point. | 131,600 | 945 | 2,000 | 361,606 | 12,842 |
| Bay of Fundy. | 153,180 | 567 | 153,180 | 140 | 15,600 |
| Shore, general. | 2,847,905 | 30,824 | 15,366,581 | 991,881 | 1,065 |
| | | | 320,524 | 69,093 | 367 |
| | | | | 16,948,462 | 388,617 |
| Total. | 4,649,569 | 84,752 | 8,931,550 | 186,819 | 49,677,980 |
| Grand total. | 10,458,913 | 398,865 | 8,931,550 | 186,819 | 147,075,265 |
| | | | 3,900,633 | 837,284 | 24,520,463 |
| | | | | 73,696,241 | 1,826,603 |
| | | | | 171,595,728 | 4,737,917 |

^a Herring, 1,768,150 pounds, value \$57,045; and caplin, dried 2,000 pounds, value \$30.

^b Herring, 8,930,800 pounds, value \$16,673; and salmon, 50 pounds, value \$36. Other items under "Miscellaneous" include bluebacks, 70,7970 pounds, value \$5,686; butterfish, 316,234 pounds, value \$7,370; catfish or wolffish, 1,79,996 pounds, value \$3,197; flounders, 632,172 pounds, value \$29,884; herring, 1,977,620 pounds, value \$20,341; horse mackerel, 671 pounds, value \$27,462; redfish, \$8,194 pounds, value \$1,134; shad, 421,701 pounds, value \$8,602; sharks, 24,418 pounds, value \$240; swordfish, 2,387,967 pounds, value \$22,559; tilefish, 28,518 pounds, value \$3,102; whiting, 4,800 pounds, value \$18; torpore, 200 pounds, value \$18; lobsters, 6,000 pounds, value \$10,080; turtle, 75 pounds, value \$3; livers, 1,153,450 pounds, value \$16,088; sounds, 10,085 pounds, value \$6,029; and tongues, 70,213 pounds, value \$5,947; spawn, 10,213 pounds, value \$6,029; and tongues, 1,500 pounds, value \$75.

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., BY AMERICAN FISHING VESSELS
DURING THE YEAR 1915, SHOWN BY MONTHS.

REPORT OF THE COMMISSIONER OF FISHERIES.

| Month. | Number of trips. | Large (10 pounds and over). | | | | Market (under 10 and over 2½ pounds). | | | | Cod. | | | |
|-----------------------------------|------------------|-----------------------------|----------|-----------|-----------|---------------------------------------|-----------|-----------|-----------|-----------|---------|-----------|--------|
| | | Fresh. | | Salted. | | Fresh. | | Salted. | | Fresh. | | Salted. | |
| | | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. |
| LANDED AT BOSTON. | | | | | | | | | | | | | |
| January..... | 243 | 521,945 | \$18,874 | 19,025 | \$14,510 | 714,205 | \$14,510 | 12,682 | 97,582 | 61,667 | \$1,326 | 635 | \$14 |
| February..... | 213 | 395,844 | 19,226 | 31,226 | 16,187 | 707,559 | 16,301 | 10,084 | 61,667 | 1,068 | 1,184 | 635 | 635 |
| March..... | 276 | 728,602 | 19,101 | 27,288 | 17,554 | 760,754 | 18,301 | 12,682 | 78,154 | 61,667 | 1,068 | 635 | 635 |
| April..... | 224 | 704,191 | 19,101 | 27,288 | 17,554 | 730,398 | 19,076 | 10,084 | 61,667 | 1,068 | 1,184 | 635 | 635 |
| May..... | 233 | 1,039,582 | 44,456 | 30,251 | 32,108 | 1,088,631 | 19,076 | 12,682 | 97,582 | 61,667 | 1,068 | 635 | 635 |
| June..... | 218 | 578,066 | 30,251 | 30,251 | 32,108 | 1,088,631 | 19,076 | 10,084 | 61,667 | 1,068 | 1,184 | 635 | 635 |
| July..... | 425 | 549,639 | 19,694 | 28,457 | 1,391,218 | 1,391,218 | 32,322 | 32,322 | 97,582 | 93,381 | 1,156 | 1,156 | 1,156 |
| August..... | 400 | 484,305 | 28,457 | 1,504,854 | 1,504,854 | 38,797 | 38,797 | 32,322 | 97,582 | 94,489 | 1,156 | 1,156 | 1,156 |
| September..... | 388 | 420,340 | 27,107 | 1,198,356 | 1,198,356 | 28,934 | 28,934 | 32,322 | 97,582 | 1,156 | 1,156 | 1,156 | 1,156 |
| October..... | 477 | 372,504 | 22,557 | 582,061 | 582,061 | 28,934 | 28,934 | 32,322 | 97,582 | 1,156 | 1,156 | 1,156 | 1,156 |
| November..... | 357 | 416,205 | 17,120 | 618,950 | 618,950 | 15,407 | 15,407 | 32,322 | 97,582 | 1,156 | 1,156 | 1,156 | 1,156 |
| December..... | 218 | 317,507 | ..... | ..... | ..... | 11,928,214 | 283,911 | ..... | ..... | 1,109,757 | 14,857 | 605 | 14 |
| Total..... | 3,772 | 7,181,682 | ..... | ..... | ..... | 11,928,214 | 283,911 | ..... | ..... | 1,109,757 | 14,857 | 605 | 14 |
| LANDED AT GLOUCESTER. | | | | | | | | | | | | | |
| January..... | 243 | 370,890 | 12,160 | 127,079 | \$5,316 | 221,035 | 3,105 | 28,660 | \$1,197 | 15,725 | 148 | 1,625 | 49 |
| February..... | 142 | 89,351 | 4,131 | 24,170 | 915 | 35,475 | 5,591 | 7,905 | 1,304 | 4,820 | 36 | 240 | 8 |
| March..... | 122 | 330,730 | 11,817 | 84,729 | 3,910 | 121,600 | 2,047 | 29,605 | 1,243 | 6,240 | 36 | 240 | 8 |
| April..... | 562 | 1,285,754 | 28,447 | 308,255 | 14,625 | 866,509 | 12,798 | 225,665 | 7,552 | 6,240 | 36 | 240 | 8 |
| May..... | 298 | 885,606 | 18,612 | 219,985 | 8,901 | 755,977 | 11,666 | 185,983 | 6,577 | 1,906 | 462 | 1,906 | 58 |
| June..... | 225 | 1,311,015 | 25,137 | 1,650,650 | 58,061 | 702,025 | 10,809 | 1,057,747 | 34,712 | 22,070 | 190 | 52,099 | 159 |
| July..... | 154 | 884,553 | 18,556 | 1,639,330 | 58,861 | 1,007,968 | 18,582 | 915,747 | 30,238 | 31,965 | 314 | 64,380 | 1,680 |
| August..... | 200 | 790,938 | 1,345 | 563,039 | 20,227 | 932,505 | 15,170 | 493,443 | 14,445 | 27,327 | 200 | 31,900 | 794 |
| September..... | 181 | 775,313 | 14,318 | 759,375 | 27,441 | 868,886 | 14,066 | 600,773 | 20,813 | 25,845 | 203 | 97,922 | 2,449 |
| October..... | 224 | 259,758 | 5,978 | 861,459 | 30,061 | 415,107 | 6,801 | 411,296 | 13,931 | 11,815 | 93 | 28,696 | 664 |
| November..... | 453 | 284,963 | 9,799 | 219,177 | 7,638 | 122,285 | 2,280 | 25,619 | 863 | 14,719 | 107 | 2,365 | 49 |
| December..... | 399 | 184,918 | 6,997 | 152,677 | 5,751 | 147,045 | 2,208 | 82,280 | 2,850 | 6,680 | 50 | 5,779 | 163 |
| Total..... | 3,472 | 7,386,852 | 170,397 | 6,679,925 | 241,707 | 6,225,910 | 100,123 | 3,994,245 | 134,725 | 255,709 | 2,057 | 292,908 | 7,662 |
| Grand total..... | 7,244 | 14,568,534 | 487,904 | 6,679,925 | 241,707 | 18,154,124 | 3,994,034 | 3,994,245 | 134,725 | 1,365,466 | 16,914 | 293,603 | 7,676 |
| Grounds E. of 60° W. long..... | 595 | 5,536,297 | 120,563 | 5,630,612 | 20,113 | 4,584,617 | 76,234 | 2,929,583 | 96,708 | 257,647 | 2,473 | 230,690 | 5,868 |
| Grounds W. of 66° W. long..... | 6,619 | 9,082,237 | 307,341 | 749,313 | 31,594 | 13,569,507 | 1,044,662 | 38,317 | 1,044,662 | 1,100 | 44 | 1,012,441 | 14,441 |
| Landed at Boston in 1914..... | 3,389 | 8,019,350 | 325,323 | 7,082,272 | 278,991 | 255,541 | 1,100 | 1,100 | 1,100 | 44 | 44 | 1,012,441 | 14,441 |
| Landed at Gloucester in 1914..... | 4,209 | 5,843,388 | 152,554 | 8,312,072 | 8,312,072 | 165,118 | 3,953,624 | 150,288 | 150,288 | 557,820 | 448 | 400,036 | 12,063 |

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLoucester, MASS., BY AMERICAN FISHING VESSELS
DURING THE YEAR 1915, SHOWN BY MONTHS. *Continued.*

| Month. | Pollock. | | | Cusk. | | | Halibut. | | |
|-----------------------------------|------------|-------------------|-----------|---------|-----------|-------------------|----------|-------------------|-----------|
| | Fresh. | | Saltd. | Fresh. | | Saltd. | Fresh. | | Saltd. |
| | Pounds. | Value, \$5,505 | Pounds. | Value. | Pounds. | Value, \$5,902 | Pounds. | Value, \$4,967 | Pounds. | Value. |
| LANDED AT BOSTON. | | | | | | | | | |
| January..... | 222,014 | 1,595 | 499,707 | 8,195 | 213,707 | \$5,702 | 19,683 | 7,183 | ..... |
| February..... | 143,595 | 1,199 | 499,862 | 8,195 | 201,277 | 8,187 | 103,151 | 12,647 | ..... |
| March..... | 211,215 | 5,586 | 285,736 | 4,078 | 171,273 | 4,078 | 135,177 | 13,177 | ..... |
| April..... | 135,744 | 2,714 | 239,308 | 3,108 | 142,677 | 2,178 | 72,318 | 7,218 | ..... |
| May..... | 229,943 | 3,507 | 102,040 | 1,675 | 102,040 | 1,675 | 239,579 | 18,509 | ..... |
| June..... | 59,389 | 10,597 | 91,765 | 1,654 | 91,765 | 1,654 | 54,574 | 6,085 | ..... |
| July..... | 661,652 | 13,737 | 251,139 | 3,841 | 284,806 | 4,693 | 101,301 | 11,301 | ..... |
| August..... | 671,647 | 18,398 | 292,505 | 5,010 | 417,352 | 6,603 | 61,432 | 4,795 | ..... |
| September..... | 553,840 | 18,498 | 292,505 | 5,010 | 417,352 | 6,603 | 46,515 | 6,566 | ..... |
| October..... | 529,300 | 14,256 | 292,505 | 5,010 | 417,352 | 6,603 | 25,363 | 5,416 | ..... |
| November..... | 188,206 | 3,406 | 292,505 | 5,010 | 417,352 | 6,603 | 18,720 | 4,269 | ..... |
| December..... | 137,900 | 2,271 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total..... | 4,284,447 | 103,733 | 3,321,681 | 53,127 | ..... | ..... | 930,409 | 102,327 | ..... |
| LANDED AT GLoucester. | | | | | | | | | |
| January..... | 294,600 | 8,824 | 4,065 | \$61 | 51,325 | 907 | 490 | \$12 | 79,546 |
| February..... | 74,488 | 5,199 | 2,200 | 3 | 38,827 | 752 | 450 | 10 | 123,520 |
| March..... | 284,541 | 7,032 | 2,489 | 38 | 103,650 | 1,551 | 2,760 | 69 | 9,159 |
| April..... | 373,147 | 7,782 | 3,585 | 63 | 434,335 | 6,893 | 4,662 | 124 | 440,169 |
| May..... | 583,211 | 5,607 | 25,600 | 458 | 410,356 | 6,269 | 130 | 3 | 136,528 |
| June..... | 129,498 | 1,276 | 56,392 | 987 | 150,275 | 2,255 | 16,036 | 398 | 451,662 |
| July..... | 31,610 | 316 | 64,040 | 1,094 | 278,117 | 4,000 | 12,100 | 302 | 255,651 |
| August..... | 68,385 | 616 | 36,800 | 406,537 | 5,649 | 13,113 | 327 | 274,850 | 19,596 |
| September..... | 73,023 | 730 | 16,346 | 292 | 688,757 | 9,644 | 14,575 | 365 | 221,831 |
| October..... | 449,235 | 5,009 | 15,462 | 272 | 318,513 | 4,413 | 18,385 | 452 | 143,672 |
| November..... | 4,010,630 | 64,847 | 616 | 11 | 27,674 | 378 | 10,775 | 270 | 56,926 |
| December..... | 2,364,496 | 39,623 | 9,035 | 148 | 11,725 | 165 | 617 | 15 | 102,151 |
| Total..... | 8,676,866 | 145,455 | 234,640 | 4,070 | 2,914,120 | 42,876 | 94,943 | 2,347 | 2,653,766 |
| Grand total..... | 12,961,313 | 249,188 | 234,640 | 4,070 | 6,235,801 | 96,003 | 94,943 | 2,347 | 3,584,175 |
| Grounds E. of 66° W. long..... | 158,076 | 2,963 | 54,635 | 957 | 1,670,590 | 23,902 | 53,797 | 1,335 | 2,884,095 |
| Grounds W. of 66° W. long..... | 12,763,237 | 246,225 | 180,005 | 3,113 | 4,365,211 | 72,101 | 41,146 | 1,012 | 700,080 |
| Landed at Boston in 1914..... | 4,655,089 | 90,372 | 105,150 | 211,177 | 4,214 | 3,078,507 | 53,577 | 111,937 | 2,236,164 |
| Landed at Gloucester in 1914..... | 7,588,457 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 316,585 |

..... 30,073

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., BY AMERICAN FISHING VESSELS DURING THE YEAR 1915, SHOWN BY MONTHS—Continued.

| Month. | Large (over 2½ pounds). | | | Medium (1½ to 2½ pounds). | | | Small (under 1½ pounds). | | |
|-----------------------------------|-------------------------|--------|-----------|---------------------------|-----------|--------|--------------------------|---------|-----------|
| | Fresh. | Saltd. | Fresh. | Fresh. | Saltd. | Fresh. | Fresh. | Saltd. | Saltd. |
| LANDED AT BOSTON. | | | | | | | | | |
| May..... | 4,900 | 245 | 573,500 | 21,992 | 4,100 | 254 | ..... | ..... | 134 |
| June..... | 3,900 | 222 | 136,500 | 7,600 | 650 | 19,400 | 1,070 | 3,700 | 17,200 |
| July..... | 5,280 | 400 | 129,500 | 8,817 | 3,300 | 165 | 22,700 | 1,592 | 178,750 |
| August..... | ..... | ..... | 8,745 | ..... | ..... | 2,000 | 140 | 571,882 | 19,215 |
| September..... | 21,040 | 1,202 | ..... | 134,134 | 5,725 | 23,600 | 2,210 | 556,498 | 18,711 |
| October..... | 18,005 | 1,801 | 22,800 | 1,980 | ..... | ..... | 519,816 | 24,507 | 467,537 |
| November..... | 56,125 | 3,870 | 819,200 | 41,534 | 119,134 | 6,797 | 67,700 | 5,012 | 1,809,932 |
| Total..... | 695,013 | 67,721 | 1,015,098 | 48,369 | 1,000,525 | 79,512 | 133,296 | 9,999 | 5,619,036 |
| Grand total..... | 258,730 | 26,316 | 751,337 | 30,098 | 289,592 | 20,488 | 61,363 | 3,991 | 281,792 |
| Grounds E. of 66° W. long..... | 436,223 | 41,405 | 213,561 | 18,271 | 730,933 | 59,024 | 91,933 | 6,008 | 5,367,244 |
| Grounds W. of 66° W. long..... | 448,311 | 45,897 | 15,200 | 50,139 | 503,967 | 34,100 | 2,412,000 | 92,620 | 2,312,991 |
| Landed at Boston in 1914..... | 123,466 | 6,395 | 844,800 | 51,384 | 167,906 | 7,910 | 669,980 | 54,310 | 9,140 |
| Landed at Gloucester in 1914..... | ..... | ..... | ..... | ..... | ..... | ..... | 322,745 | ..... | 1,114,475 |

^a includes herring from Newfoundland, 2,368,150 pounds frozen, \$68,945, and 8,930,800 pounds salted, \$186,783.

The fish landed at Boston and Gloucester, Mass., by American fishing vessels are taken principally from fishing grounds lying off the coast of the United States. In 1915, 71.78 per cent of the quantity and 70.74 per cent of the value of the catch landed by the American fishing fleet at these ports were obtained from these grounds. Of the remainder, 9.41 per cent of the quantity and 9.70 per cent of the value were taken from fishing banks off the coast of Newfoundland, 18.73 per cent of the quantity and 19.35 per cent of the value from grounds off the Canadian Provinces, and less than 1 per cent of both the quantity and value from the coast of Labrador. Newfoundland herring constituted 6.58 per cent of the quantity and 5.39 per cent of the value of the products landed at these ports during the year. The herring were taken on the treaty coasts of Newfoundland, but cod and other species from that region were obtained chiefly from fishing banks on the high seas. All the fish caught by American fishing vessels off the Canadian Provinces were from offshore fishing grounds. The catch from each of these fishing regions is given in detail in the following table:

QUANTITY AND VALUE OF FISH LANDED BY AMERICAN FISHING VESSELS AT BOSTON AND GLOUCESTER, MASS., IN 1915, FROM GROUNDS OFF THE COAST OF THE UNITED STATES, NEWFOUNDLAND, AND CANADIAN PROVINCES.

| Species. | United States. | | Newfoundland. ^a | | Canadian Provinces. | | Total. | |
|----------------|----------------|---------------|----------------------------|---------------|---------------------|---------------|----------------|---------------|
| Cod: | <i>Pounds.</i> | <i>Value.</i> | <i>Pounds.</i> | <i>Value.</i> | <i>Pounds.</i> | <i>Value.</i> | <i>Pounds.</i> | <i>Value.</i> |
| Fresh..... | 23,695,413 | \$689,361 | 484,815 | \$9,962 | 9,907,896 | \$189,529 | 34,088,124 | \$888,852 |
| Salted..... | 1,876,888 | 71,419 | 3,009,390 | 105,146 | 6,081,495 | 207,543 | 10,967,773 | 384,108 |
| Haddock: | | | | | | | | |
| Fresh..... | 51,712,661 | 1,185,386 | 100 | 1 | 6,100,289 | 120,065 | 57,813,050 | 1,305,452 |
| Salted..... | 69,675 | 1,235 | 14,075 | 246 | 46,844 | 880 | 130,594 | 2,361 |
| Hake: | | | | | | | | |
| Fresh..... | 11,248,569 | 232,237 | 54,360 | 704 | 3,285,886 | 44,529 | 14,589,315 | 277,470 |
| Salted..... | 24,713 | 428 | 91,200 | 1,450 | 184,712 | 3,129 | 300,625 | 5,007 |
| Pollock: | | | | | | | | |
| Fresh..... | 12,762,282 | 246,213 | 665 | 12 | 198,366 | 2,963 | 12,961,313 | 249,188 |
| Salted..... | 180,005 | 3,113 | 7,865 | 138 | 46,770 | 819 | 234,640 | 4,070 |
| Cusk: | | | | | | | | |
| Fresh..... | 4,550,491 | 71,946 | 3,345 | 52 | 1,681,965 | 24,005 | 6,235,801 | 96,003 |
| Salted..... | 41,146 | 1,012 | 5,387 | 133 | 48,410 | 1,202 | 94,943 | 2,347 |
| Halibut: | | | | | | | | |
| Fresh..... | 699,496 | 84,225 | 1,149,408 | \$4,014 | 1,735,271 | 133,548 | 3,584,175 | 301,787 |
| Salted..... | 305 | 21 | 145,665 | 11,304 | 140,540 | 10,184 | 286,510 | 21,509 |
| Mackerel: | | | | | | | | |
| Fresh..... | 6,534,400 | 321,778 | ----- | ----- | 810,174 | 61,238 | 7,344,574 | 383,016 |
| Salted..... | 2,668,485 | 190,986 | ----- | ----- | 905,343 | 40,077 | 3,573,828 | 231,063 |
| Herring: | | | | | | | | |
| Fresh..... | 1,977,620 | 20,381 | 2,368,150 | 68,945 | ----- | ----- | 4,345,770 | 89,326 |
| Salted..... | ----- | ----- | 8,930,800 | 186,783 | ----- | ----- | 8,930,800 | 186,783 |
| Swordfish: | | | | | | | | |
| Fresh..... | 1,307,317 | 145,155 | 868 | 68 | 930,782 | 76,336 | 2,238,967 | 221,559 |
| Miscellaneous: | | | | | | | | |
| Fresh..... | 3,830,532 | 87,084 | 2,000 | 30 | 41,644 | 866 | 3,874,176 | 87,980 |
| Salted..... | ----- | ----- | 750 | 36 | ----- | ----- | 750 | 36 |
| Total..... | 123,179,998 | 3,351,980 | 16,269,343 | 469,024 | 32,146,387 | 916,913 | 171,595,728 | 4,737,917 |

^a Includes 17,975 pounds of salted cod, valued at \$617, and 102,151 pounds of salted halibut, valued at \$8,673, from the Labrador coast.

Cod.—In 1915 there were 33 vessels employed in the salt-bank fishery and 102 in the market fishery landing their fares at Boston and Gloucester. Considerable cod was landed also by vessels operating on shore grounds. There were landed at these ports 45,055,897 pounds of fresh and salted cod, 34,088,124 pounds of the former and 10,967,773 pounds of the latter, valued at \$1,272,960, against 47,529,625 pounds in 1914, of which 36,079,873 pounds were fresh and

11,449,752 pounds salted, valued at \$1,359,416. There was, therefore, a decrease in the quantity in 1915, as compared with the previous year, of 1,991,749 pounds in the fresh and 481,979 pounds in the salted cod landed.

Several large fares of cod were caught during the season of 1915. A trip amounting to 359,483 pounds taken on trawl lines was landed at Gloucester in July, and one of the dory hand-line fleet brought in 478,365 pounds in September, this being the largest fare taken since 1909, when the same vessel weighed off 479,433 pounds.

Haddock.—The haddock fishery in 1915 was carried on with about the same success as in the previous year. The quantity of haddock landed was 57,943,644 pounds, valued at \$1,307,813, an increase over the previous year of 189,516 pounds in quantity and a decrease of \$73,343 in value. The catch of haddock by line trawlers landed at Boston amounted to 30,776,733 pounds, of which 16.57 per cent were "scrod." The greater part of the scrod haddock brought in by line trawlers came from the inshore grounds, the offshore banks supplying a greater proportion of large haddock. On the inshore grounds the amount of scrod haddock taken varied from 18 to 22 per cent of the total catch and on the offshore grounds from 2 to 8 per cent.

Pollock.—The pollock fishery, which in recent years has supported a considerable fleet of small craft employing purse seines as a means of capture, was carried on with greater success than in 1914. The total catch of pollock landed at Boston and Gloucester, including those taken on hand and trawl lines and in gill nets, was 13,195,953 pounds, having a value of \$253,258, an increase of 741,230 pounds in quantity and \$53,522 in value compared with 1914. As in previous years, most of the pollock landed by purse seiners and gill netters were caught in spring and fall months.

Halibut.—In the last few years the halibut fishery on the Atlantic coast has fluctuated but little. The yield of fresh and salted halibut in 1915 was 3,870,685 pounds, 3,584,175 pounds of the former and 286,510 pounds of the latter, valued at \$323,296, an increase of 491,100 pounds and \$46,946 over 1914. The largest catches of this species were made on Georges, Browns, La Have, Quereau, Western, and Grand Banks, the last-mentioned bank supplying the greatest amount. The fishery was conducted throughout the year, but the bulk of the catch was taken during the early spring and summer months. The vessels regularly employed in this fishery numbered 33 sail, although many of the cod hand-line and trawl-line fishermen frequently caught halibut in considerable quantities. The usual activity was displayed in this fishery in the spring of 1916. At the end of May the fleet engaged numbered 26 vessels, and a considerable number of fairly large fares were landed.

The otter-trawl fishery.—This method of fishing, as in 1914, was carried on by 12 steamers. With the exception of several trips landed at Portland and an occasional trip disposed of at Gloucester during such times when there was a glut of fresh haddock in the market, the bulk of fish caught by otter trawlers was landed at Boston. The year's catch was 21,116,300 pounds, representing 380 trips, an increase of 8 trips. There were landed from Georges 105 trips, from South Channel 248, Western Bank 26, and Browns Bank 1. As in the previous year, Western Bank was resorted to in March, April, and May, when haddock were less plentiful on Georges and

in the South Channel than during the winter months. Of the total quantity of fish landed at Boston by this class of vessels, 17,062,732 pounds were haddock, of which 39.28 per cent were "scrod." The great disparity in the landings of small fish by this method as compared with line trawls is confined wholly to haddock, the large and small fish of other species caught by the two methods, such as cod, cusk, and hake, being more equally divided.

On July 20, 1915, the otter trawler *East Hampton* landed at Gloucester 310,000 pounds of fresh fish, most of which were haddock. The largest trip previously brought in was 300,000 pounds, caught by the otter trawler *Long Island*. These were the largest fares ever taken by American otter trawlers.

Mackerel.—The amount of salted mackerel taken in 1915 was 19,691 barrels, exceeding the catch of the previous year by 4,170 barrels. The catch off the New England coast was 15,480 barrels and on the Cape Shore, including a few fares from the Gulf of St. Lawrence, 4,211 barrels, or 750 barrels less than was taken in those regions in 1914. The total catch of fresh mackerel by the fleet was 71,564 barrels, compared with 68,582 barrels the previous season. The number of fresh mackerel taken on the Cape Shore was 781,000, which exceeded the catch of 1914 by over 200,000 fish. In the fall of 1915 several vessels of the seining fleet made phenomenal catches in Massachusetts Bay, one vessel making a stock of \$6,548 in three weeks, at which time it was reported that a much larger body of mackerel was on the coast than had been observed for several years.

The mackerel fishery in the spring of 1916 showed a marked improvement over that of 1915, the catch up to May 15 being nearly double the amount recorded the previous season on the same date. Three vessels of the seining fleet stocked over \$9,000 each and one \$11,246, the last-mentioned stock being \$2,361 more than the highest made by a single vessel to the end of May, 1915. There were engaged in the southern mackerel fishery 24 seiners and 58 netters. Fifteen of the latter sailed from Gloucester and 43 from other ports. The number of seiners was one less than in 1915, but there was an increase of 41 netters. A portion of the seining fleet sailed on March 24, but none of the netters sailed until April 25. The first mackerel of the season of 1916, amounting to 7 barrels, were caught on April 5 about 80 miles east by south from Cape Henlopen, or practically in the same locality where the first fish were encountered the previous season. The fish were landed at Lewes, Del., from which place they were shipped to New York by rail. Other small trips were caught in the same region within a few days, but the first fare of any considerable size was landed at New York on April 26, one vessel bringing in 41,800 fish, followed the next day by the arrival of 6 vessels with trips ranging from 6,000 to 40,000 fish. From this time until the middle of May the supply of mackerel in the New York market was about equal to the demand. For the week ended May 3 the amount of fresh mackerel landed was 553,000 in number, mostly large and medium, compared with 268,576 fish last year, which were mostly small. Many of the large mackerel in April sold for 40 cents each. The average price ranged from 12 to 20 cents for large and medium, while tinkers brought from 3 to 6 cents a pound.

On May 31 there were 1,200 mackerel landed at Boston, the first fare of the season. Four vessels of the seining fleet sailed for the

Cape Shore May 25, and on June 6 the number had increased to 24 sail. The first mackerel of the season from this region were landed at Boston on June 9, the trip consisting of 10,000 large and 35,000 medium fresh mackerel and 170 barrels salted. On June 10 there were 3 other arrivals from the Cape Shore with fares taken off Halifax and Liverpool, the combined catch amounting to 125,000 of mixed fresh mackerel and 230 barrels salted. At that time there were 15 other seiners on the ground, all of which captured schools of mackerel. Mackerel were reported plentiful on the Cape Shore until June 21, and many large trips were taken. The highest stock made by a single vessel in this region was \$6,343, which is the largest recorded for one trip in recent years. Fish were also abundant during the month on grounds in the vicinity of No Mans Land, the entire fleet of seiners and netters fishing in that locality doing well.

Swordfish.—This species was more plentiful in 1915 than in the previous year, and 2,238,967 pounds, having a value of \$221,559, were landed at Boston and Gloucester, an increase of 739,123 pounds and \$43,860 over 1914. There were 42 vessels engaged in the fishery, operating mostly on the more eastern grounds, although some good catches were made on Georges, Nantucket Shoals, and adjacent grounds. On July 20, 17 vessels landed at the Boston Fish Pier 1,126 swordfish that had been taken on Georges. This was probably the greatest number of swordfish ever landed at an American port in one day.

Winter gill-net fishery.—The winter gill-net fishery practically ceased at the end of May. A fleet of 30 vessels was employed at Gloucester during the season, and there were a few vessels that operated out of other ports. Fishing was conducted on the inshore grounds along the New England coast from Cape Ann to Portland. As in previous years, the principal species taken by this method were cod, haddock, and pollock. While the fleet as a whole did not meet with the same degree of success as in some years past, the fishery was an improvement over the previous season. Several good stocks were made, one vessel making \$30,000, with a share of \$1,500 to each member of the crew. This was probably the highest record ever attained in one season by a vessel engaged in the winter gill-net fishery.

Italian fishing boats.—The number of Italian motor boats fishing out of Boston and landing their catch at that port has increased in the last few years. At the present time there are approximately 200 boats of this class engaged in the shore fisheries, all of which are too small for registration, being under 5 tons, and in consequence their catch is not recorded in the Boston and Gloucester bulletins. These boats take a variety of species and operate several kinds of fishing gear, namely, trawl lines, hand lines, and drag seines.

Some ten years ago the catch of this class of boats consisted largely of flounders, but in the last few years greater efforts have been made to capture other species of ground fish, such as cod, haddock, cusk, hake, etc. Mackerel also have been taken to some extent. In 1915 the Italian catch landed at Boston, and sold through the New England Fish Exchange, was over 3,500,000 pounds of fish, valued at \$135,000. The catch consisted largely of cod, haddock, pollock, hake, and cusk. The amount of flounders landed was about 36,000 pounds.

PACIFIC HALIBUT AND COD FISHERIES.

The halibut banks off Oregon and Washington, recently surveyed by the steamer *Albatross*, were resorted to during the month of June, 1915, by a portion of the halibut fleet sailing out of Seattle, from which grounds 26 trips of halibut were taken in that month, comprising 1,318,000 pounds, valued at \$64,623. As halibut were scarce on these grounds in the summer months, the remainder of the catch of that species landed at Seattle from June to December was taken from banks farther north, extending from Flattery Bank, off the coast of Washington, to Portlock Bank, Alaska. This amounted to 13,876,970 pounds, having a market value of \$820,585. In the first half of the calendar year 1916, 25 fares were brought from the banks off Oregon and Washington, amounting to 931,692 pounds, valued at \$77,819. The total quantity of halibut landed at Seattle during that period, including the catch from banks farther north, was 7,391,384 pounds, valued at \$608,947, taken in 274 trips.

According to the Pacific Fisherman, the total catch of halibut on the Pacific coast by American vessels in 1915 was 50,238,390 pounds, of which 33,133,313 pounds were landed at Seattle, 11,323,500 pounds in Canadian ports, and 5,781,577 pounds in Alaska, against 48,902,575 pounds the preceding year, a gain of 1,335,815 pounds. The American fleet engaged in this fishery consisted of 100 sail, known as "independent" and "company" vessels, there being 89 of the former and 11 of the latter, ranging in size from 7 to 196 tons. The Canadian fleet comprised 27 vessels, the catch of which amounted to 16,031,265 pounds, an increase of 1,074,465 pounds over 1914.

The fleet employed in the cod fishery of the Pacific coast numbered 20 sail, including 2 vessels engaged in transporting cured fish from the shore stations in Alaska. Three regions were represented in the fishery—San Francisco by 9 vessels, Puget Sound by 8 vessels, and Alaska by 3 vessels. One of the Alaskan vessels was lost in the early part of the season. The fleet met with very good success and made a catch of 3,798,071 fish, equivalent to 19,092,319 pounds, the fish being reckoned at 4½ pounds each. The catch fell short of that of 1914 by 122,831 fish, or 552,739 pounds.

The work of collecting statistics of the quantity and value of fishery products landed at Seattle, Wash., by American fishing vessels was reestablished in June, 1915, by the appointment of a local agent at that port. The products landed from July, 1915, to June, 1916, comprised 513 trips, including 19,580,163 pounds of halibut, valued at \$1,330,609, and 948,024 pounds of other species, valued at \$23,285; a total of 20,528,187 pounds, valued at \$1,353,894. The monthly receipts by species are shown in the following table:

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT SEATTLE,
WASH., BY AMERICAN FISHING VESSELS DURING THE FISCAL YEAR 1916.

| Month. | Number of trips. | Halibut. | | Cod. | | Black cod. | |
|----------------|------------------|---------------------|---------------|----------------|---------------|----------------|---------------|
| 1915. | | <i>Pounds.</i> | <i>Value.</i> | <i>Pounds.</i> | <i>Value.</i> | <i>Pounds.</i> | <i>Value.</i> |
| July..... | 61 | 2,700,430 | \$152,859 | 645 | \$10 | 39,300 | \$855 |
| August..... | 36 | 1,698,288 | 92,253 | 1,312 | 20 | 8,860 | 217 |
| September..... | 53 | 2,172,000 | 132,496 | ----- | ----- | 332,000 | 8,300 |
| October..... | 31 | 1,644,792 | 103,952 | ----- | ----- | 130,545 | 3,164 |
| November..... | 30 | 2,312,527 | 147,994 | ----- | ----- | 17,000 | 425 |
| December..... | 28 | 1,660,742 | 92,108 | ----- | ----- | 26,000 | 650 |
| 1916. | | | | | | | |
| January..... | 8 | 923,055 | 68,049 | ----- | ----- | 18,000 | 360 |
| February..... | 7 | 706,931 | 47,669 | 60 | 1 | 16,232 | 443 |
| March..... | 31 | 815,209 | 52,226 | ----- | ----- | 16,175 | 484 |
| April..... | 61 | 1,207,372 | 130,438 | ----- | ----- | 10,566 | 318 |
| May..... | 89 | 2,024,105 | 129,672 | ----- | ----- | 84,955 | 2,124 |
| June..... | 78 | 1,714,712 | 150,893 | ----- | ----- | 200,233 | 4,883 |
| Total..... | 513 | <i>a</i> 19,580,163 | 1,330,609 | 2,017 | 31 | 89,866 | 22,223 |

| Month. | Ling cod. | | Rock cod. | | Total. | |
|----------------|----------------|---------------|----------------|---------------|----------------|---------------|
| 1915. | <i>Pounds.</i> | <i>Value.</i> | <i>Pounds.</i> | <i>Value.</i> | <i>Pounds.</i> | <i>Value.</i> |
| July..... | ----- | ----- | 1,000 | \$15 | 2,739,730 | \$153,714 |
| August..... | ----- | ----- | 10,000 | 250 | 1,708,793 | 92,495 |
| September..... | ----- | ----- | ----- | ----- | 2,505,312 | 140,816 |
| October..... | ----- | ----- | ----- | ----- | 1,785,337 | 107,366 |
| November..... | ----- | ----- | ----- | ----- | 2,329,527 | 148,419 |
| December..... | ----- | ----- | ----- | ----- | 1,686,742 | 92,758 |
| 1916. | | | | | | |
| January..... | ----- | ----- | ----- | ----- | 941,055 | 68,409 |
| February..... | ----- | ----- | ----- | ----- | 723,163 | 48,112 |
| March..... | ----- | ----- | ----- | ----- | 831,444 | 82,711 |
| April..... | 6,006 | \$120 | 11,413 | 293 | 1,235,357 | 131,169 |
| May..... | ----- | ----- | ----- | ----- | 2,109,060 | 131,796 |
| June..... | 11,732 | 230 | 5,990 | 123 | 1,932,667 | 156,129 |
| Total..... | 17,738 | 350 | 28,403 | 681 | 20,528,187 | 1,353,894 |

^a Includes 5,000 pounds of salt halibut, worth \$125, landed in August. The remainder of the catch was sold fresh.

PROMOTION OF AMERICAN CAVIAR.

One of the most valuable of all fishery products is caviar, which is prepared from the roe of sturgeon primarily, but also from that of the paddlefish of the Mississippi Valley, and sometimes, under appropriate descriptive names, from the eggs of carp, whitefish, and other species. The product has always been imported extensively, while it is known that suitable material in this country is often wasted through ignorance of the fishermen as to the methods of preservation to employ. After a suitable investigation of the matter, the Bureau issued an economic circular describing in simple language the methods which may be efficiently employed by any fisherman. The paper had the twofold object of preventing unnecessary waste through ignorance or neglect and of awaking a more effective interest in the protection of the sturgeon and the paddlefish.

INTRODUCTION OF NEW AQUATIC FOODS.

One of the most useful ways in which the Bureau of Fisheries can serve the fishermen and the general fish-eating public is to make known new sources of aquatic foods and to assist in establishing fisheries and markets therefor. The conspicuous success achieved in the case of the sea mussel has been referred to in previous reports. This excellent, abundant, accessible, cheap, and widely distributed shell-fish, formerly neglected, has now become a staple in certain important markets. Various other water products of great prospective value, but now largely unutilized, should be exploited as speedily as possible, but the limited funds and facilities at the disposal of the Bureau for such work make it impossible to conduct an active campaign with more than one or two such articles at one time. In the fiscal year 1916 one hitherto neglected fish has been given a permanent and important place in the fisheries and fish trade by the Bureau's efforts, and a campaign of great prospective consequence has been inaugurated with reference to several others.

In October, 1915, the Bureau undertook to popularize the tilefish in the belief that it is a fish of great prospective food value. Its utilization had been advocated years ago, but the efforts to introduce it were not sufficiently comprehensive or sustained to bring success, and the fish in reality came into some disrepute because of the failures that attended the attempts to give it a commercial status. The task confronting the Bureau was to induce fishermen to catch the fish, dealers to handle the fish, and the public to consume the fish, and to bring all this about simultaneously. The effective methods pursued made it possible for the Government to withdraw from the campaign within one month and to intrust future developments to private enterprise.

The essential feature of the exploit was the chartering of a regular fishing vessel with practical fishermen as its crew. The auxiliary schooner *Stranger*, of Gloucester, carrying 12 men, was the vessel selected for the purpose. The Bureau had guaranteed the *Stranger* \$1,500 for one month's service, but in 27 days she caught 38,383 pounds of tilefish, which, after deducting commissions, sold for \$2,036.63; and not only was the Bureau at no expense whatever for the fishing operations, but the proceeds, taking no account of several thousand pounds gratuitously distributed for advertising purposes, yielded a substantial bonus to the crew over their regular remuneration.

When the wholesale trade of New York was requested to cooperate in the proposed campaign, the unfortunate past stood in the way of immediate acquiescence. "There is no demand for the fish," said the dealers, but the Bureau explained that getting the fish and creating a demand were its part of the work and that all that was desired of the trade was a cheerful willingness to handle the fish to satisfy such demand as might develop. When the first fare was landed in New York on October 22, four or five dealers in Fulton Market rather reluctantly agreed to handle the fish, some of which were given away and the remainder sold for 5 cents per pound. When the fourth trip arrived but 20 days later, 15 dealers were competing for the fish, which sold for 7 cents. In the interval a demand had arisen which no large wholesale or commission house could afford to ignore. This demand was created solely by an advertising campaign which kept the fish constantly be-

fore the public and concentrated attention on its points of interest and excellence. Newspapers were furnished items recounting the unusual history of the fish—its discovery, practical extermination, and reappearance; incidents in the campaign were exploited; fish were more or less conspicuously supplied to prominent persons; leading hotels and restaurants were induced to give the tilefish prominence on their menus; a great motion-picture company placed a camera man on the *Stranger* and exhibited motion pictures of the fishery as a feature of its weekly news reel; and the Bureau's own advertising matter was distributed freely.

The propaganda conducted in behalf of this fishery covered practically the entire field. The fishing grounds were found and pointed out to fishermen; a regular commercial fishing vessel was engaged to demonstrate the financial yield of this fishery under regular industrial conditions; the wholesale trade was enlisted in the distribution of the fish; the retailer was furnished with attractive display advertising matter calling his customers' attention to the fact that the fish was on sale; and the consumer was told about the tilefish and how to cook it, and his curiosity and interest were stimulated to the point where he wished to try it and asked his dealer for it. As a consequence, when the Bureau ceased its fishing operations, other vessels were already at work, and within 10 days of the landing of the last fare by the *Stranger* eight schooners were either in the fishery or about to enter it and by the end of the month had landed in New York about 156,000 pounds of tilefish.

The progress of this fishery has far exceeded expectations. While New York continues to be the center of the industry, Boston, Atlantic City, Newport, and other places have become practically interested by putting vessels in the fishery. At the end of June, 1916, the New York fleet consisted of 13 vessels making regular trips to the fishing grounds, although earlier in the season a number of other vessels were engaged. The catch has varied from month to month, but has shown a general upward trend as increased fares were brought in to meet the growing demand, and the yield in June exceeded that of any preceding month, aggregating over 1,221,000 pounds landed at New York in 28 fares. A new record was made in July, 1916, when 2,200,000 pounds were landed at New York, 230,000 at Boston, and various minor fares at other ports.

By the end of the fiscal year 1916, when the fishery was only eight months old, upward of 4,388,500 pounds of tilefish, which brought the fishermen over \$210,000, were caught and sold. The monthly receipts at New York were as follows:

| Month. | Pounds. | Month. | Pounds. |
|---------------------|---------|------------------|-----------|
| November, 1915..... | 156,500 | April, 1916..... | 626,000 |
| December, 1915..... | 170,200 | May, 1916..... | 620,000 |
| January, 1916..... | 398,000 | June, 1916..... | 1,221,000 |
| February, 1916..... | 469,000 | Total..... | 4,275,700 |
| March, 1916..... | 615,000 | | |

The tilefish grounds extend along the edge of the continental shelf from a point south of Nantucket to an area east of Atlantic City. Few fish have been taken in depths over 100 fathoms, and the best



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fish are in from 60 to 65 fathoms of water, as to the kind and quality of bait offered backs, menhaden, clams, etc., are very acceptable, they will bite freely on inferior kinds of bait, making the bait question comparatively easy to solve.

The fishery has proved a great deal more remunerative than was at first expected by most fishermen and is now considered by them as being well established. The prices received by the fishermen have at times been as high as 7 cents a pound and as low as $1\frac{1}{2}$ cents, the average being about 5 cents. The fish bears shipment perhaps better than any other staple fish of the Atlantic coast and now reaches consumers all over the eastern half of the country. Some large shipments have gone as far west as Kansas City. The catch in recent months has been at the rate of 20,000,000 pounds per annum.

Following long consideration and much discussion, the present Congress has passed an act, approved June 21, 1916, which provides a way of alleviating the losses sustained by the fishermen, more especially those of the Atlantic coast, from the ravages of dogfishes. The act carries an appropriation of \$25,000 to enable the Commissioner of Fisheries to conduct investigations and experiments to this end, and the method of procedure, as recommended by the Bureau and understood by Congress, is to make the dogfishes useful. Mistaken economic and biological conceptions as to the possibility of bringing about the extermination of dogfishes have been abandoned, and all persons now interested in the welfare of the fishermen and the advancement of the fisheries are united in the efforts that will be made, under authority of law, to convert an injurious and hitherto useless article into a valuable asset. While the dogfishes and other sharks yield by-products, such as oil, gelatin, and leather, of undoubtedly economic importance, their principal utility comes through their known value as food. The task before the Bureau is to overcome the deep-seated prejudice that exists against these fishes and to determine the ways and means for creating a demand for fresh and preserved dogfish that will react on the fishermen and enable them to market their catch at a profit.

